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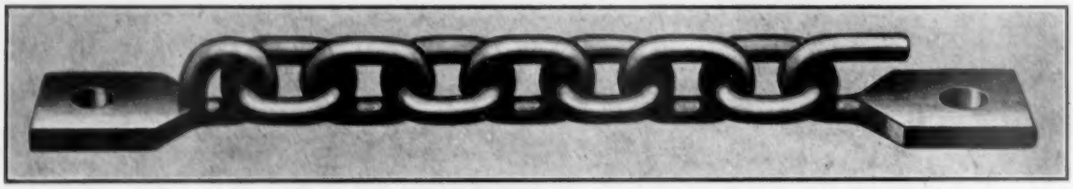

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Railway Age

DAILY EDITION

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WE GUARANTEE that of this issue, 12,000 copies were printed; that of these 12,000 copies, 10,300 were mailed to regular paid subscribers to the Railway Age and Railway Mechanical Engineer; 110 were mailed to advertisers; 490 were provided for counter and news companies sales, new subscriptions, bound volumes, samples, copies lost in the mail and office use; 1,100 copies for distribution at Atlantic City.

THE RAILWAY AGE is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

One of the railroad delegations attending at the Mechanical Division meetings has adopted the practice of discussing the reports to come up at each session in an informal meeting of its own some time before the session convenes. This offers a splendid opportunity for each representative of the road in attendance to take part in the discussion with a well-defined idea of the relation of the report to the interests of his own road. It also insures that each representative of the group will get the greatest possible benefit from the report itself and from the discussion of other members on the floor of the convention. The general adoption of this practice by other groups would give point to the formal discussion and lead to a more rapid crystallization of ideas on the floor with a saving of time of the sessions. Have you tried it?

Have You Tried This?

The corrosion of steel cars has been an important matter ever since this type of equipment was introduced. At one time the Master Car Builders' Association had a committee on this subject. Numerous compounds for coating the interior of the car to prevent rusting were tried but were found to be worthless. Since attempts to protect the surface have failed the only recourse seems to be in the development of non-corrosive plates. The trials conducted by the American Society for Testing Materials show that there is a considerable difference in the rate of corrosion of various kinds of iron and steel. Some railroads are specifying the materials which showed up best in these tests for use on freight cars. Other roads feel that the only satisfactory tests are those made on cars in actual service. The reduction of corrosion in freight cars means so much to the railroads that the question should be settled conclusively and as promptly as possible. Is not this a subject which the Mechanical Division might well consider?

Corrosion of Steel Cars

The essential difference between a schedule shop and a shop operating without a schedule is the difference between order and disorder. No one can compare the two shops to the disadvantage of the latter and yet shop schedules have not been installed as generally as seems desirable. It is difficult to understand why so many railroad men fail to appreciate and benefit by the advantages of this system. One general foreman said recently: "I don't need a shop schedule with a schedule supervisor telling me how to run things. I am on the job at six o'clock in the morning, two hours before the men arrive, and I know how everything is going by personal observation." Obviously, attention to details is not the function of the general foreman and besides it is absolutely impossible for one man to know all the details of the work as carried on in a large railroad shop. Production can never be brought to the desired point until some system is installed for co-ordinating the work of the different departments, making sure that material is received and repair work completed as needed. Men often, and in fact usually do, work harder in non-schedule shops than in those provided with a schedule system; also with less to show for their work. The trouble is that they are not all working for the same thing at the same time. In general, the object of the shop schedule is to co-ordinate the work of the different departments and eliminate lost time, thereby increasing shop production. Delays for material are largely prevented and the supervising officers are relieved of a mass of details, enabling them to give their attention to more important problems of personnel.

Why Have A Shop Schedule?

We suggested yesterday that the foreman or the subordinate officer who comes in direct contact with the men is the most vital link in a railroad organization. In other words, these men are key men. Is this fact always recognized when they are selected for these positions? How do you select them? What kind of men do you promote to these positions? To deal properly with the men the foremen should be thoroughly imbued with the spirit of the organization and fully informed as to its purposes, and as to why certain practices or methods are used or are to be used. Do you coach them along these lines? Are

How Do You Select Foremen?

they fitted intelligently and patiently to represent the organization in dealing with the men under them? Do you promote them because they are master workmen and that possibly in addition to this they are respected by their fellows, or do you look first for qualities of leadership—qualities which include self-control, a practical understanding of human nature, and a spirit of fairness. No matter how thoroughly a man understands the detail operations of his department, he is sure to fail in greater or less degree unless he is fully qualified to lead his men as well as direct them. You may say that such arguments are purely academic and that you know how to pick a boss, but do you? How many failures have you made in picking men and could not some of these failures have been overcome if you had not relied too much upon superficial observation or a hunch, but had taken steps to study and analyze each man critically before you decided to promote him?

An Always Progressive Industry

The officers and committees of the Railway Supply Manufacturers' Association, and especially President J. F. Schurch and Chairman Charles W. Beaver, of the Exhibit Committee, deserve praise and congratulations for having got the exhibits so completely in place before the opening of the conventions. In addition, the attractiveness of the decorations merits mention. When the procession, headed by Chairman Tollerton, of the Mechanical Section, and Mr. Schurch, marched through to the meeting hall yesterday morning, almost everything on the pier was in its proper place and ready for inspection. The ballroom looked especially attractive. The A. R. A. is composed of Canadian as well as United States railways, and the Exhibit Committee had very appropriately had the Canadian flag draped with the Stars and Stripes around the ballroom. Those who have read the entertainment program have noticed that a new departure has also been made by arranging for Friday night to be "Canadian Night." The work done by the officers and committees of the Railway Supply Manufacturers' Association in making the arrangements for the convention, and the splendid exhibit made by the railway equipment and supply manufacturers immediately following a prolonged period of almost the worst business in their lines ever known, illustrate the ability, enterprise and courage with which the railway equipment and supply industry always is managed. No industry suffers more ups and downs; it is usually feast or famine with it. At the same time, no industry is managed with more uniform steadiness and progressiveness. Those in it have learned by long experience that the normal condition of the industry is either what seems abnormal depression or abnormal prosperity, and go along year by year pretty much as if they are always ready for either.

Different Progress, Not Less

Chairman Tollerton's address yesterday morning brought out some interesting facts concerning railroad electrification. He showed that some of the European railroads have been paying at least five times as much for coal as have the roads in the United States. There is an abundance of potential and developed water power in Europe, and this, coupled with the high price of fuel, in a number of cases has made electrification imperative. In this country the fuel saving possible by electrification is well worth consideration, but it is not as important a factor as that of dealing with conditions of heavy traffic and congestion. Mr. Tollerton also spoke of criticism which has appeared in publications of wide circulation to the effect that our railways are not progressing as rapidly in the use of electricity for traction as are European railways. In spite of indications to the contrary, American electric locomotive design is ahead of all countries in many respects because of difficulties encountered and overcome in designing locomotives which will transmit large power from the motors to the driving wheels. The design of machines utilizing small amounts of power is one thing, but when that amount of power is increased to unprecedented proportions, the problem takes on a very different aspect. No European equipment as now developed would be adequate to handle trains on the Norfolk & Western or on the Chicago, Milwaukee & St. Paul. Added to this, it should be said that both the split-phase alternating current and the 3,000-volt direct-current systems, together with the machinery that has made them possible, were developed in the United States. These two systems are probably the only ones which can meet all the electrification requirements of American railroads. The requirements of this country demand a different development, but we are in no sense behind.

Co-operative Research Needed

In commenting on American railroad equipment a British engineer recently paid a tribute to the railroads of this country for the careful and thorough research which he stated had been an important factor in establishing American equipment as representing the highest development of engineering skill applied to rolling stock. The value of work such as has been done at Perdue and at Altoona is recognized the world over and it has unquestionably been instrumental in raising the standard of efficiency to the point which it has now reached. In the past research has usually been conducted by individual roads and because of the large expenditure involved the work has lagged when business conditions were unfavorable. In recent years comparatively little of this work has been done and at present there are many important innovations waiting to be tested. Some of these are radically different from prevailing types, but seem very promising. In the interest of economy they should be tried out as promptly as possible to determine whether they possess any merits. Probably no road is at present in position to test such radical innovations as, for example, turbine driven or Diesel engine locomotives, although to the railroads collectively such equipment might mean a saving of tens of millions of dollars. The logical method for handling such investigations would seem to be a co-operative research bureau as mentioned by Chairman Tollerton in his opening address. By this arrangement the expense could be fairly distributed among the roads, so that the cost to each road would be comparatively small and duplication of work could be avoided. As suggested by Mr Tollerton, any central research bureau should not be carried to the point where it would destroy initiative on individual roads. Perhaps the method should be confined to more extended investigations, but this is a question that should be easily settled. The important thing is to develop an organization that can carry on much of the constructive research

which the individual roads are not in a position at the present time to undertake.

Do You Know the Cost?

In carrying on a manufacturing enterprise, no matter how good the product may be and no matter how well it may meet the needs of the purchasing public for which it is designed, successful operations for any extended time will be impossible unless all the activities of both the manufacturing and the sales departments are based on an accurate knowledge of all items of expense from the purchase of the raw materials to the shipment of the finished product. The absolute necessity of an accurate, detailed knowledge of costs has brought out in recent years highly developed cost accounting systems suitable for all kinds of manufacturing enterprises. In a period which is now only a memory, it was possible for many concerns to get along without such a detailed knowledge of costs and yet make substantial profits. Such examples are now few and far between. Many of those who neglected to install a proper cost accounting system, or who afterwards failed to govern their activities by the knowledge thereby obtained either went through the hands of a receiver or were driven out of business. These cases served as effective warnings and caused others to see the handwriting on the wall. In the operation of railroad locomotive and car shops, mechanical officers have not been forced to compete with other shops and they have not had the same incentive as manufacturing concerns to investigate their operating costs. Moreover, the reports which are called for by the government do not disclose the necessary factors. As a consequence, the mechanical officer usually knows very little about the complete detailed costs of doing work in his shops and commonly overlooks a number of elements which enter into overhead. In other words, his training has not caused him to think continuously in terms of cost. There is, fortunately, a growing interest in the subject—small as yet, but still a start. In this matter railroad men might often learn a valuable lesson from supply and other manufacturing concerns which would enable them to inaugurate many changes which would make it possible to decide intelligently whether it was to their advantage to make or to purchase certain articles and how to operate their plans with considerably greater efficiency than is now being done.

The Call for Large Motor Passenger Cars

Observing the satisfactory operating results obtained from the use of light gasoline rail motor cars, a number of railroad men have publicly expressed the opinion that a car which would seat from 50 to 70 people should be built to meet the requirements of certain sections of their lines. This opinion is unquestionably well founded and there is no doubt of the fact that such a car would have a wide field of usefulness provided it could be operated at a decidedly lower cost than a small steam operated train. Unfortunately the problem involved in the design of such a car is radically different from that of the smaller car and a number of new factors are introduced. Low operating costs of the small car have been predicated upon extremely light weight and the utilization of engines perfected for use in road vehicles. An increase in the length of the car body beyond that of the small car adds much more in weight than in seating capacity. The same dead-weight of car per passenger cannot be obtained in a car seating some 60 persons that is now possible in one seating only 35 persons. Then, to drive a larger and heavier car at the necessary speeds would require a larger engine than has yet been used by any truck builder. To be sure gasoline engines of sufficient power have been built for aeroplanes but these are of high first cost and although of light weight, are short lived. These characteristics were of secondary importance for aeroplane service but are prohibitive when applied to passenger car propulsion. A satisfactory gasoline engine of larger size could probably be developed by the engine builders but this would take time and they are apparently loath to tackle the problem until assured that there will be an extended sale for such engines if designed. The fact remains that at present no suitable engine is available. For such larger cars a gasoline-electric drive may be better adapted than a gasoline-mechanical one. In studying the problem of the larger unit motor car, or one capable of hauling a small trailer, other types of motive power, such as Diesel engines, must be considered and even the high-pressure steam engine should not be overlooked. The problem might well be taken under consideration by a special committee of the Mechanical Division of the American Railway Association.

A Neglected Element of Train Cost

There is a pronounced tendency to make the mechanical department the goat whenever heavy retrenchments in operating expenses become necessary. To a certain extent it is inevitable that the maintenance departments bear more than their proportion of such retrenchments, because maintenance work can be deferred without immediately destroying the effectiveness of the transportation machine. But the very defenselessness of the department against the principle has led to its too extensive application, with results clearly set forth by Mr. Tollerton in his address yesterday morning, when he said that "invariably operating expenses of a railroad are effected inversely by the ratio of maintenance of equipment expenditures. * * * * Injudicious savings in maintenance result in actual loss through the increase in transportation costs and heavier later costs for deferred maintenance." There is a most intimate and inextricable relationship between the expenses controlled by the mechanical and the operating departments. The relation between these accounts in the aggregate is well known, but few railroads have developed satisfactory systems of analysis to determine their relative effect on unit costs of train service. Unrelated studies of this kind have been made in a number of cases, the best example of which is probably the statistical work of the fuel departments, where these departments are well organized. Operating officers also give close attention to analyzing crew wage costs. In neither case, however, has much attention been given to the maintenance accounts beyond a check on their aggregate amount. They are as worthy of analysis on a unit cost basis as are any of the other operating expenses, and any system of control of the cost of train operation which does not take into account this important element is likely to be misleading. If the analysis of individual accounts has proved to be of value, is it not reasonable to expect an equally good return by expanding such work to cover all expenses in a coordinated statistical department? Its work would make a quantitative knowledge of the relationship between all factors of train operating cost available to the officers of all departments.

Program For Today

DIVISION V.—MECHANICAL, American Railway Association, is holding its meetings in the Greek Temple on the Million Dollar Pier. The program for today follows:

Thursday, June 15, 1922
9.30 a. m. to 12.30 p. m.

Discussion of Reports on:

Prices for Labor and Material.
Arbitration.
Tank Cars.
Loading Rules.
Train Lighting and Equipment.

ENTERTAINMENT

10:30 a. m.—Orchestral Concert, Entrance Hall, Million Dollar Pier.

3:30 p. m.—Orchestral Concert with Impromptu Dancing, Entrance Hall, Million Dollar Pier.

4:30 p. m.—Tea will be served in Entrance Hall.

9:30 p. m.—Grand Ball, Ball Room, Million Dollar Pier.

The Entertainment Yesterday

YESTERDAY'S ENTERTAINMENT features consisted of a morning concert on the pier by the Albert Taylor orchestra of New York, an afternoon concert including informal dancing and the serving of tea at 4:30 o'clock, followed in the evening by dancing in the ballroom and a pleasing program of musical selections.

The program of the evening was in charge of Sub-Chairman Charles L. Brown, of the Entertainment Committee, and his fellow workers, J. Cizek, C. W. Floyd Coffin, W. G. Cook, D. L. Eubank, J. W. Fogg, Oscar C. Hayward, Webb G. Krauser, W. A. McWhorter, N. C. Naylor and S. Worcester Sargent.

Fifteen-Cell Batteries for Car Lighting

PHILADELPHIA, Pa.

To the Editor:

The editorial entitled "The Wrong Man Again" which appears in the June issue of the *Railway Electrical Engineer*, while expressing well founded criticism of the lack of co-operation or even actual antagonism which occasionally exists between the mechanical and electrical departments of some railroads, presents the particular case used as a text in such an incomplete form as to be very misleading in regard to the results obtained with 15-cell car lighting batteries.

In the ilustration used in this editorial, reference is made to the unsatisfactory results obtained by omitting one cell from the usual 16-cell car lighting battery. It might be inferred that this was the only change that was made and that in all other respects the equipment was identical, and included lamp regulators in both cases; but this fact is not specifically brought out, and the casual reader is left with the impression that a 15-cell car lighting battery calls for special low voltage lamps. This, of course, is absolutely contrary to the facts, as there are many axle lighting equipments in service on some of the largest trunk line railroads using 15 cells of battery where the same standard lamps are used as with all other equipments on the system, and the illumination obtained has elicted especially favorable comments from the traveling public. These results have been due to the use of the constant voltage system and the omission of the lamp regulator.

To quote the words of the editorial above referred to, "Any electrical man knows" that the minimum drop of voltage in an ordinary lamp regulator in average operating condition will more than offset the voltage of one cell of battery, so that with an equipment which eliminates the lamp regulator, 15 cells of battery will give at least as good, and in most cases, better illumination than that obtained from an equipment requiring a lamp regulator with 16 cells of battery. The usual form of lamp regulator, consisting of a pile of carbon disks under more or less compression, is permanently connected between the battery and the lamps and introduces a loss of voltage which is always deducted from the battery voltage applied to the lamps. Equipments which do not require a lamp regulator eliminate this loss and permit the omission of one cell of battery.

J. LESTER WOODBRIDGE,
CHIEF ENGINEER, THE ELECTRIC STORAGE BATTERY COMPANY.

[The writer of the editorial in an effort to show the need of good electrical men in railroad service, chose an example with which he was familiar to illustrate the point in question. The railroad which made the effort to operate with 15 cells of lead battery was using an equipment with a lamp regulator in which there was a minimum drop of about two volts. This fact was not mentioned and it was assumed that the electrical reader would understand that the effort was made to use 15 cells with equipment designed for 16 cells. It is true that some manufacturers of car lighting apparatus maintain that 16 cells are desirable under all circumstances and it is also true that others build equipment designed to operate with 15 cells and get results which to the users, the maintainers and the traveling public are highly satisfactory.—Editor].

C. I. C. I. & C. F. Association Meeting

WM. P. ELLIOTT, secretary of the Chief Interchange Car Inspectors & Car Foremen's Association, announces that a meeting of the executive committee will be held at the Park Street Hall, which is on the ground floor of the Marlborough-Blenheim Hotel, on Thursday afternoon at 3 P. M. All members of the association are invited to attend.

Please Wear Your Badge, Always

WE HAVE all been cautioned about wearing our badges at all times, particularly when on the pier. Please be careful about this, for you will greatly aid the executive committee in its labors to protect the welfare of the members. And when you visit the pier, chiefly on the nights when important functions are scheduled, wear badges where they can easily be seen.

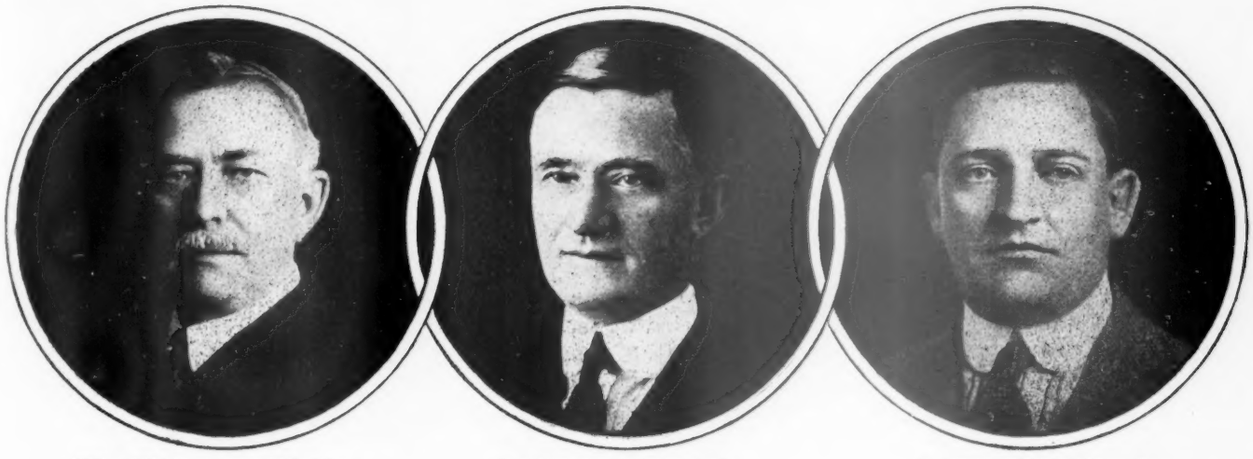
Exhibit Notes

THE TORCHWELD EQUIPMENT COMPANY, Chicago, has transferred its exhibit from Space *E* on the porch to Space No. 11 in the main exhibition hall.

The Laughlin-Barney Machinery Company of Pittsburgh was listed in Wednesday's *Daily* as being located in Space 705. This company has moved to Space 131.

A typographical error was made in the *Daily* for Wednesday with regard to the Fibreboard Company, Boston, Mass. This company is located in Space 42.

The Production Machine Company's address was incorrectly stated in Wednesday's *Daily* under the list of exhibitors. The general office of this company is located in Greenfield, Mass.



Vice-Chairman J. Coleman | Chairman W. J. Tollerton | Secretary V. R. Hawthorne

American Railway Association—Division V—Mechanical

Chairman Tollerton's Address and Report on Scheduling Feature Opening Session

AFTER AN ABSENCE of two years the members of the American Railway Association—Division V—Mechanical met again Wednesday, June 14, 1922, in their Third Annual Convention in the Greek Temple at Young's Pier, Atlantic City, N. J. The meeting was called to order at 9:45 by W. J. Tollerton, general mechanical superintendent of the Chicago, Rock Island & Pacific, and chairman of the division. Chairman Tollerton invited members of the United States Railroad Labor Board, who were present, to come forward during the opening exercises. Doctor Newton W. Cadwell, pastor of the Olivet Presbyterian Church, then opened the convention by invoking the Devine blessing. The address of welcome was delivered by Edwin F. Bader, mayor of Atlantic City.

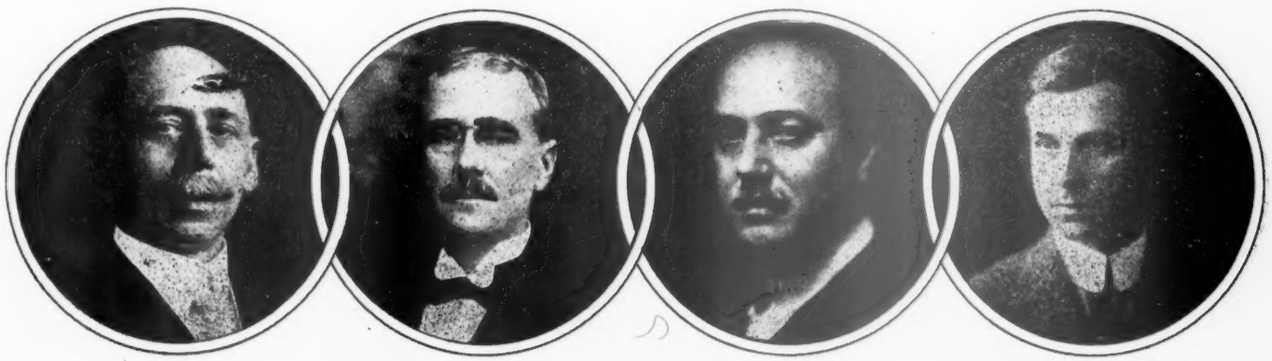
Mayor Bader's Address

Mayor Bader said in part: This is a proud moment for me today. I made my maiden welcoming speech in this hall two years ago. While I have not improved in speechmaking, I have always a feeling of good fellowship for all the boys here, the majority of whom I know. I want to say, that of all the conventions coming to Atlantic City, this is the biggest and best. As mayor of this town, representing its citizens, I would like to sit in the conference that you hold when planning for another convention. Before deciding on any other city, I would like to know it. Give me a chance. I can't talk before a large public gathering, but I can say a few things around the round table. Our idea is to give you a good time while here, and I know you have it.

So there will be no trouble around, I have assigned to your organizations—it was a pleasure for me—at least ten special detectives, not to watch over you, but to look after you.

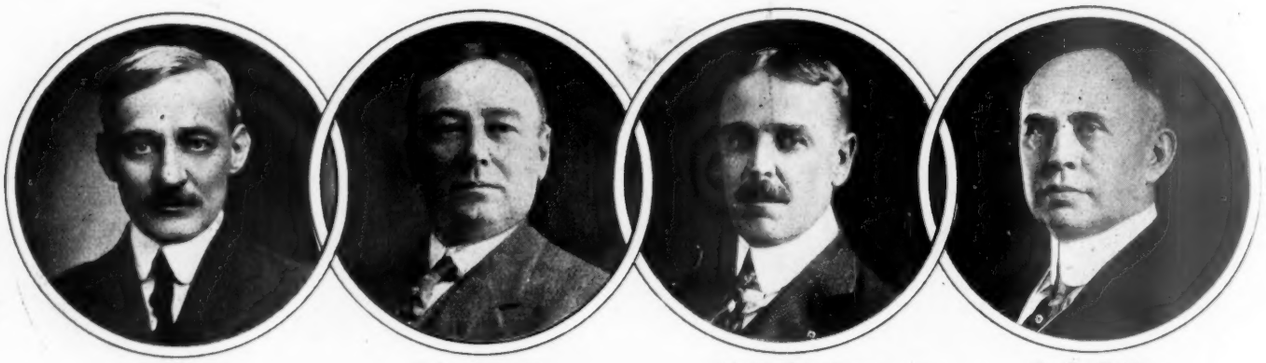
I am going to give the chairman the key. He can go wherever he likes. So can everyone else, but I will hold the ten detectives responsible for your actions while here. Of course you can have all the privileges. Everything is free—if you can find it. If any of our people do not do the right thing by the members of your association I hope you will let me know. With an organization of this kind we don't want any of you to go away and say you were not treated right.

On behalf of the members of the American Railway Association, chairman Tollerton expressed thanks and appreciation for the consideration and welcome always accorded the Association, when coming to Atlantic City.



J. J. Tatum | C. F. Giles | H. L. Ingersoll | W. H. Winterrowd

Members General Committee, Division V—Mechanical—A. R. A.



J. T. Wallis | John Purcell | T. H. Goodnow | C. E. Fuller

Members General Committee, Division V—Mechanical—A. R. A.

Chairman W. J. Tollerton's Address

The present day and the near future should go down in history as a period of especial progress in the development of devices and design of equipment to bring about the greatest efficiency in railroad transportation service combined with the utmost economy in maintenance and operation.

Passing without comment the generally bad business conditions of the past year or two, the railroads are confronted with a field of competition in the form of automobiles and auto trucks, which is having a serious effect on local traffic, both passenger and freight. In so far as auto trucks are concerned they are in position to operate at a very low cost, practically on a government subsidy, having no other expense than a small tax for investment in or maintenance of roadway, terminal and other station requirements, so they can establish rates and short time deliveries which make the most keen competition. The railroads, in fact, are frequently placed in the peculiar position of paying a heavy portion of both the investment and maintenance of these highways. Concrete roads are constructed by districts or counties, sometimes under state legislation, whereby the territories lying adjacent thereto are designated as "benefit districts," upon which special improvement taxes are levied. When these roads parallel the railroad tracks, as they commonly do, the raidroad is expected to pay this improvement tax and its share of the taxes to keep up the highway, notwithstanding the fact that instead of being benefitted it is seriously injured by the competition which takes away local passenger and freight business.

The traffic through the Panama Canal in possible competition with the railroads of the United States has been increasing greatly, and in a nine months' period of 1921 compared with the same period of the previous year increased about thirty per cent, representing a probable loss in tonnage to the transcontinental railroads running well into the billions of net ton miles. With these conditions confrontng us, the need for the greatest economy combined with increased efficiency in the handling of traffic will be readily realized.

Railway Prospects Brighter

Here I wish to touch on what I consider one of the most important questions before us, that of harmony and co-operation. Closer association between the executives, local or subordinate supervisory officers and the employes is steadily becoming more firmly established, and its fulfillment will undoubtedly have far reaching effect. This is being accomplished, first, by right general policies, including proper interest in the welfare of the employes and, second, the most careful selection and education of supervisory officers to carry out and continue these policies. I have abounding faith in the capabilities of the officers of the American railroad organizations, and also in the rank and file of employes, to solve these problems to the entire satisfaction of themselves and our real employer, the American public.

We have had many serious obstacles to overcome in the past and there is gratification in the knowledge that some of the troubles, which were felt at the time to be practically insurmountable, have been overcome and in a general way have started a healthful reaction for the ultimate benefit of the railroads.

We have been through the war period, the reconstruction period, and at the present time a governmental regulation period, which appeals to me as one which is based on an earnest endeavor of our statesmen to rise above the persecutions that characterized some of the earlier policies of regulation, particularly in individual states. With the increased facilities for education through the school systems of this country and the ever extending publication of newspapers and magazines, public opinion is becoming more powerful and effective every year. There is no question but that the general public has been brought to a sharp realization of the fact that in the interference with efficient operaion of the transportation systems the public itself is the real sufferer.

The record which has been made within the last two years in reducing the operating expenses of the railways in spite of the many unfavorable conditions should cause pride and gratification to railway officers. In the first three months of the year 1917 the average operating expenses of the railways of the United States were about $7,250,000 per day. There was a great increase during the next three years, and in the first three months of 1920, during two months of which the railways were under government control, the average expenses were $13,772,000 a day. There was a further increase later in the year 1920, owing to large advances in wages and other causes, and in the first three months of 1921 the average expenses per day were $13,633,000. Throughout last year most drastic economies were made, and it is interesting to find that in the first three months of 1922 the average operating expenses per day had been reduced to $11,366,000, which was $2,267,000 a day less than in the same period of 1921, and about $2,406,000 a day less than in the first three months of 1920. When it is considered that the freight traffic handled in the early part of 1922 was somewhat larger than in 1921, the significance of these figures becomes apparent. They show the extent to which the pre-war efficiency of operation is being restored.

In our particular field, the maintenance of equipment, there has been a constant endeavor to effect economies by the adoption and application of admitted improvements to the limit of available funds. The present abnormal conditions should not be permitted to interfere with this policy.

Co-operative Research Suggested

The suggestion has been offered, and is worthy of very earnest consideration of the proper committees, that same arrangement be promulgated by the American Railway Association for co-operative tests of railway appliances. This would involve the advisability of establishing some central system for joint investigation, so that tests which would require heavy expenditures could be carried on at the expense of the association and would make available to all railroads, at a minimum expense, information and data as to devices which promise economy in maintenance and operation. Procedure of this kind would be of great benefit, but care should be exercised to see that it would not have the effect of destroying initiative on the part of individual roads who are

in position to originate or advance the development of economical designs and appliances.

Reduction of Expenses Not Always Economy

When we speak of economies we should be very careful not to apply or think of this term as merely a reduction in expenses, if they are of such a nature that the ultimate expenditures may suffer an increase in consequence thereof. My observation has been that, invariably, operating expenses of a railroad are affected adversely by the ratio of maintenance of equipment expenditures. Sufficient expenditures for proper maintenance of equipment make economical transportation costs. Injudicious savings in maintenance result in actual loss through the increase in transportation costs and the heavier later costs for deferred maintenance.

It is readily to be understood that, unless equipment is properly maintained, locomotives kept in condition to give maximum hauling capacity with minimum fuel consumption, and freight cars in condition to give a maximum period of service with the lowest consistent time held on repair tracks, we cannot hope for economical operation on the part of the transportation department.

Study and Develop Fuel Saving Devices

Locomotive fuel, representing nearly 35 per cent of the cost of train operation, is in itself a question of major importance in the entire transportation problem and, due to its volume in proportion to the total expense, is naturally an item of greatest opportunity for effecting economies. Having this in mind, I would command for your special consideration that fuel saving devices should have most careful study and development.

What the Committees Are Doing

We will have a report from the Committee on Car Construction, which will no doubt accentuate interest in car repair work and design. Observation and study of the bad order cars on repair tracks will indicate those parts which are most frequently failing and in need of repairs. In many instances these failures can be overcome by application of improved designs; in others, metal instead of wooden construction will eliminate failures which result in keeping freight car equipment on repair tracks, to say nothing of the excessive delay to trains en route, which is very expensive in transportation costs.

This committee offers for your approval this year a design of special rolled section center sill. As in a great measure the final presentation of acceptable plans for standard cars depends on settling the matter of underframe design, an affirmative letter ballot vote on this proposition is recommended.

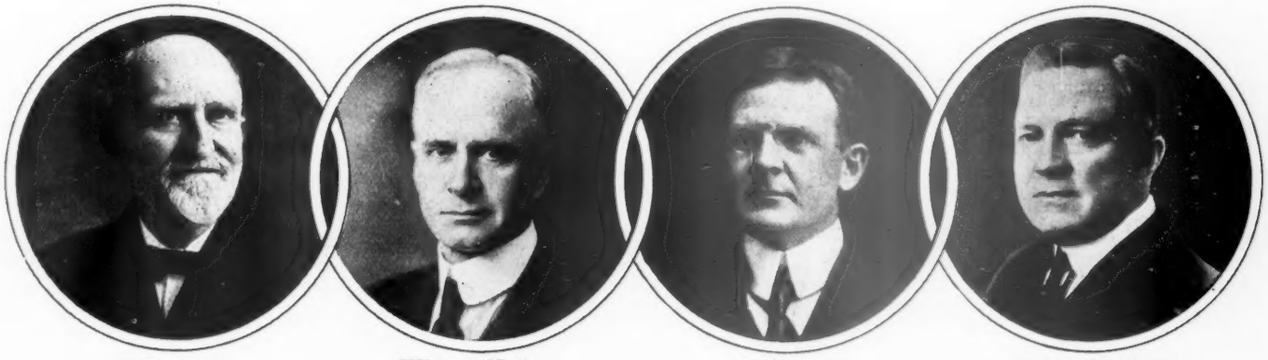
Another very important consideration is that of giving more attention on each railroad to the proper maintenance of freight cars of other railroads. Neglect of minor repairs required on foreign cars invariably leads to more extensive damage, and this is probably one of the greatest causes of deteriorated freight car equipment. Your Committee on Prices for Labor and Material has given consideration to this in endeavoring to arrive at just and fair rates of compensation for repairs to freight cars to induce an interest in repairing foreign cars. It is certain that means must be determined upon so that freight cars will receive necessary attention when off the home lines, thereby preventing an accumulation of defective conditions to be repaired at a needlessly heavy expense when returned to the owners.

Owing to the great number of freight cars on foreign lines during the past few years, under-maintenance of cars, heavy trains and the considerable number of old types of cars without reinforcements still in service, the Arbitration Committee has had to consider and decide a large number of important cases during the past year. This committee is asking relief from the numerous trivial questions and is recommending that in the future all questions submitted to the committee be jointly submitted, as arbitration cases in accordance with the provisions of Interchange Rule 123. This committee is also recommending restoring to the Rules of Interchange rules governing the responsibility for damage to foreign cars based on combination of defects denoting unfair usage, in addition to the present rules governing unfair usage based on cause.

The Committee on Locomotive Headlights and Classification Lamps is recommending important additions to the standardization of these devices.

The Committee on Specifications and Tests for Materials is recommending for your approval as recommended practice, an entire revision of the present specifications covering paints and paint material.

The Committee on Loading Rules is recommending some detail revision of these rules, which is the result of conferences held throughout the year with shippers of the various materials represented.



J. S. Lentz | Willard Kells | A. Kearney | C. E. Chambers

Members General Committee, Division V—Mechanical—A. R. A.

The Committee on Scheduling of Equipment Through Repair Shops in its report is presenting recommendations and information which should be given careful thought and consideration by the members, in view of the economies which might be effected.

The railroads should individually supplement the work of our Committee on Shop and Terminal facilities, Structures and Machinery, with earnest thought to inaugurating and extending the best shop practices and availing themselves of labor saving equipment to obtain the greatest returns for maintenance of equipment expenditures.

With proper regard for local conditions, consistent improvements should be vigorously advocated. Installation of power plant machinery and boilers of proved merit, electrification of shops, using individual motor drives on large machines and group drives on smaller ones, portable motor driven machines to avoid unnecessary loss of time of mechanics traveling back and forth between erecting floors and machine shop, and use of power driven truck transportation for handling material around shops and between storehouses and shops, are all productice of economical and efficient results far more than offsetting the original costs and should not be overlooked in your deliberations.

The Standard and Recommended Practices of the division have not been published in complete form since 1918. The several committees of the division under the general supervision of the Committee on Manual have codified and published the complete Standard and Recommended Practice of the former Master Car Builders' and American Railway Master Mechanics' Associations as harmonized and brought up-to-date, including practices since adopted by the Mechanical Division, American Railway Association. These standards and recommended practices are contained in one loose leaf binder in very convenient form and are

now available to the members for reference. The committees participating in this work deserve commendation for the splendid way in which this Manual is arranged.

I have just returned from Rome, after having the honor of serving as a representaitve of the American Railway Association at the International Railway Congress. The trip was very interesting. Many papers were discussed and conclusions reached which have been published very fully in the *Railway Age*. Fourteen languages were spoken at the Congress, although officially all discussions were in English, French and Italian. The attendance was very large and the Italian railway officials were very courteous and obliging, doing everything they could to make our stay in Rome as pleasant as possible.

From a railway standpoint little may be said, but I would like to suggest to anyone desiring to criticize the American railroads, their equipment and methods of handling the public, that they first journey on some of the railroads of continental Europe. Intended criticisms of American railroads would, I am sure, be changed to words of highest commendation.

Why European Railroads Are Electrifying

In this connection a word might be said on the subject of electrification. The Swiss and Italian railways, and to a lesser extent the French railways, are engaged in making and carrying out plans for the electrification of certain of their lines. Some criticism has appeared in publications of wide circulation to the effect that our railways are not progressing as rapidly in the use of electricity for traction as these European railways. The visitor to Europe is especially impressed by the difference between some important conditions in some of the countries of Europe and in the United States. The Italian railways have been paying upward of $25.00 a ton, measured in American money, for coal. The average price paid by the Paris-Lyons-Mediterranean of France in 1920 was 266 francs, or at the present rate of exchange, about $26.00. Even in 1921 its coal cost it, at the present rate of exchange, about $18.00 a ton. The cost of coal to the Swiss railways is also extremely high. The average cost of coal to the railways of the United States in February, 1922, including freight charges for its transportation, was only $3.56 a ton. You will see, therefore, that, at the minimum estimate, coal costs the railways of Southern Europe on the average five times as much as it does those of the United States. On the other hand, these countries, especially Switzerland and Italy, have large supplies of natural water power, while in many parts of the United States such power is not available. It follows that the savings in fuel cost to be made by electrification in some of these countries of continental Europe is much larger than in this country, and we should not allow this important fact to be overlooked in discussions of the subject.

This is the last meeting at which I am to have the honor of presiding as Chairman of the Mechanical Division, and I wish to express my deep appreciation of the splendid support you have given me at all times. I must particularly express my appreciation of the assistance of the General Committee. I know that this organization has before it a very bright and productive future and that you will extend to my successor the same hearty co-operation you have given me.

Association Business

The minutes of the 1920 annual meeting were approved and Chairman Tollerton announced the selection of committees as follows: Committee on Subjects, John Purcell, chairman; R. L. Kleine, Willard Kells, C. E. Fuller, and C. F. Giles. Committee on Resolutions, C. E. Chambers, chairman; F. W. Brazier and H. T. Bentley.

Tribute to A. W. Gibbs

C. E. CHAMBERS: Owing to the recent loss of A. W. Gibbs, chief mechanical engineer of the Pennsylvania System, one of our very important members, a man who gave this Association a great deal of valuable service for a long period of years, and who was also chairman of the Tank Car Committee for a great number of years, I wish to offer this resolution: (A memorial resolution giving a brief sketch of Mr. Gibbs' life was here presented.)

J. SNOWDEN BELL: It would be, it seems to me, unnecessary to say a word with regard to the mechanical ability or the personal character of Mr. Gibbs, and I only want to pay one word of personal tribute to his character. I never had the pleasure of meeting a more amiable gentleman and a kindlier gentleman to others than Mr. Gibbs. Once I heard this remark made about him, which I think is as fine a remark as could be made about anyone. A man said, after meeting Mr. Gibbs, "He is the kind of man who is always going out of his way to help somebody."

THE CHAIRMAN: Are there any further remarks in regard to this resolution on the death of our esteemed member, Mr. Gibbs? If not, I would like to suggest to the members that the resolution be adopted, standing, and that the members remain with bowed heads for one minute, as a testimonial of respect to Mr. Gibbs.

(The members then stood for one minute and the resolution was thereby adopted.)

Report of General Committee

SINCE THE LAST annual meeting, the General Committee has held meetings on the following dates: July 21, 1920; October 20, 1920; March 30, 31, 1921; October 26, 27, 1921; March 14, 1922 and June 13, 1922.

The membership of the Division at the present time includes 206 railroads, representing 379 memberships in the American Railway Association, and in addition thereto, 100 railroads, associate members of the American Railway Association. These railroads, have appointed 788 representatives in the Mechanical Division. In addition there are 1,529 affiliated members and 126 life members in the Division.

The last session of the Division was held June 9-16, 1920. Since that time the General Committee has taken action on several important subjects. This action is outlined in the following report and your approval is respectfully requested.

ANNUAL MEETING 1921

Account of unusual conditions prevailing, meeting of the Division was not held in 1921. The reports of Committees for 1921 upon which action was taken by your committee will be included in the printed proceedings for this year.

LETTER BALLOTS 1920

Recommendations from Committees received at the 1920 annual meeting and ordered submitted to letter ballot of the members were sent to the members in separate circulars containing the recommendations from each Committee and result announced by circulars to the members.

LETTER BALLOTS 1921

Recommendations from the following Committees were received in 1921 and submitted to letter ballot of the members: Specifications and Tests for Materials; Car Construction; Brake Shoe and Brake Beam Equipment; Train Brake and Signal Equipment; Tank Cars and Loading Rules.

The letter ballot circular containing the recommendations from these committees was sent to the members under date of August 20, 1921, as Circular No. DV-215. The result of this letter ballot was announced to the members in Circular No. DV-225, issued January 25, 1922.

MANUAL

The Standard and Recommended Practice of the Division has been brought up to date and compiled under the direction of the

Committee on Manual. The Manual contains the standards and recommended practices adopted by the former Master Car Builders' and American Railway Master Mechanics' Association, harmonized and brought up to date, and the standards and recommended practices since adopted by the Mechanical Division, American Railway Association.

Interchange Rules

The recommendations of the Arbitration Committee and the Committees on Prices for Labor and Materials and Depreciation for Freight Cars, approved at the 1920 annual meeting, were incorporated in a revision of the Rules of Interchange for 1920. The recommendations from the Arbitration Committee and the Committee on Prices for Labor and Materials contained in the reports of these committees for 1921 were considered by your committee and approved, with the exception of recommendations for changes in Rules 32, 43 and 70, which involved changes in well established principles, and incorporated in a revision of the Rules of Interchange for 1921. In addition, as necessity arose, your committee has approved revisions of detail rules which have been issued as supplements to the Rules of Interchange.

Loading Rules

The recommendations from the Committee on Loading Rules considered at the annual meeting for 1920 and approved by letter ballot of the members, were incorporated in a revision of the Loading Rules for 1920. The recommendations from the Committee on Loading Rules for 1921 were considered by your committee and submitted to letter ballot of the members. Those changes which were approved by letter ballot were issued to the members as a supplement to the Loading Rules for 1920.

Maximum Load Markings on Freight Cars

The letter ballot ordered taken on this subject in 1919, as result of report from the Committee on Car Trucks, resulted in this proposition being approved by more than the required two-thirds majority. Conferences have been held with representatives of the Traffic and Transportation Divisions to arrange for the necessary adjustment in tariffs. This subject has been considered also by your committee at practically every meeting, but due to difficulties that have been encountered the committee is not prepared at this time to make any definite recommendations as to further action. This decision was covered in Circular S, III-191, issued February 15, 1921.

Change in Name of Section III—Mechanical

As a result of revised Articles of Organization and By-Laws of the American Railway Association adopted in 1920, and the following resolution adopted at your 1920 annual meeting, the name of your organization has been changed from Section III—Mechanical to Division V—Mechanical, Master Car Builders and Master Mechanics.

Mechanical Inspection Department

Your committee has approved recommendation for the establishment of a department to investigate repairs to foreign cars and billing therefor. This department at the present time consists of a chief inspector and five inspectors acting under the direction of the General Committee.

Fuel Conservation

At the request of the Board of Directors for the formation of an organization within the American Railway Association, to consider and make recommendations on Fuel Conservation, the General Committee, in co-operation with the General Committees of the Operating and Purchases and Stores Divisions, appointed members to represent the Mechanical Division on the Joint Committee on Fuel Conservation, which reports direct to the Board of Directors. The Committee on Fuel Economy and Smoke Prevention of the Mechanical Division has been discontinued.

Joint Inspection of Standard Material

A joint committee to study the subject of joint inspection of standard materials has been appointed by your General Committee in co-operation with the General Committee of the Purchases and Stores Division. Final report from this committee has not yet been received.

Joint Inspection of Equipment

The General Committee, in co-operation with the General Committee of the Transportation Division and the Car Service Division, appointed a special committee on the subject of joint inspection of Equipment. Recommendations from this committee have been approved by letter ballot of the railroads as recommended practice, covered in Circular No. 2247, issued April 13, 1922, by the General Secretary.

Locomotive and Car Builders' Cyclopedias

The General Committee has appointed special committees to colaborate with the publishers of the Car Builders' and Locomotive Cyclopedias.

Safety Appliance Hand Books

Your committee has arranged with the publishers of the small handbook of U. S. Safety Appliances for Cars and Locomotives for an A. R. A. edition. This action is in response to the demand for these safety appliances in handy pocket form, and the books will be supplied to railroads on requisition at cost.

Joint Committee on Automatic Train Control

Your committee has appointed representatives of the Mechanical Division to serve on the Joint committee on Automatic Train Control with representatives from the Operating and Engineering Divisions and Signal Section.

Investigation of Power Brakes and Power Brake Systems

Your committee also arranged through Mr. R. H. Aishton, President, for the Committee on Safety Appliances to handle matters for the Association in connection with the Investigation of Power Brakes and Power Brake Systems before the Interstate Commerce Commission, and further arranged for the Committee on Train Brake and Signal Equipment to assist the Committee on Safety Appliances in this matter.

Extension of Effective Dates of Rules and Regulations

As occasion has arisen during the past two years, your Committee has, upon recommendation of the proper committees of the division, extended the effective dates of certain provisions of the Rules of Interchange and Loading Rules. These extensions have been covered by circular issued to the members.

Committee on Nominations

The committee recommends that no ballot be taken this year for members of the Committee on Nominations, and that the present committee be continued with the exception of Wm. Schlafge, who has left railroad service, and that W. J. Tollerton, (Chicago, Rock Island & Pacific), be appointed to fill this vacancy. The Committee on Nominations will then be as follows: F. W. Brazier (Chairman), New York Central; H. T. Bentley, Chicago & North Western; J. J. Hennessey, Chicago, Milwaukee & St. Paul; C. E. Chambers, Central Railroad of New Jersey; and W. J. Tollerton, Chicago, Rock Island & Pacific.

[The lists of new life members and of members who have died during the year, contained in the report, will be found elsewhere in this issue.]

Discussion

C. E. Chambers: By reason of the action taken by the General Committee as to the omission of the letter ballot, not being in conformity with the constitution, I move that the Association approve their action in that respect. (*The motion was duly seconded, put to vote and carried. The committee report as a whole was also ordered approved*).

Report of Committee on Nominations

IN ORDER TO avoid the necessity of electing an entire new set of officers and General Committee, your Committee on Nominations recommends that the terms of these officers and members of the General Committee expiring June, 1922, be extended to June, 1923; and that officers and members of the Committee only be elected at this time to fill the vacancies created by those whose term of office expired in 1921 but who were continued in office until June of this year, and of those who have left railroad service and are no longer eligible for office in the Division.

Your committee recommends that the term of office of the Vice-Chairman and the following members of the General Committee be extended to June, 1923:

J. S. Lentz, Lehigh Valley; C. E. Fuller, Union Pacific System; H. L. Ingersoll, New York Central; J. J. Tatum, Baltimore & Ohio, and Willard Kells, Atlantic Coast Line.

Your committee also nominates W. J. Tollerton, Chicago, Rock Island & Pacific, for member of the General Committee, to serve for the unexpired term of John Purcell which ends June, 1923; and H. C. Oviatt, general mechanical superintendent, New York, New Haven & Hartford, to serve for the unexpired term of Wm. Schlafge which ends June, 1923, as Mr. Schlafge has left railroad service.

Your committee nominates the following to serve until June, 1924:

For chairman, J. Coleman, assistant to general superintendent motive power and car department, Grand Trunk System.

For members of General Committee, C. F. Giles, Louisville & Nashville; T. H. Goodnow, Chicago & North Western; A. Kearney, Norfolk & Western; J. T. Wallis, Pennsylvania System; W. H. Winterrowd, Canadian Pacific; C. E. Chambers, Central Railroad of New Jersey, and L. K. Sillcox, Chicago, Milwaukee & St. Paul.

For Vice-Chairman (to serve unexpired term of Mr Coleman which ends June, 1923); J. Purcell, Atchison, Topeka & Santa Fe.

The report is signed by F. W. Brazier (Chairman), N. Y. C.; H. T. Bentley, C. & N. W.; J. J. Hennessey, C. M. St. P., and C. E. Chambers, C. R. of N. J.

Discussion

F. W. Brazier: The Committee offers the following resolution: Resolved that the report of the Nominating Committee be accepted and that the recommendation of the Committee to extend the terms of office of those officers and members of the General Committee expiring June 1922 to June 1923 be approved, and that a formal ballot be taken covering the recommendation of the Committee for officers and members of the General Commmittee with terms expiring June 1924 and to fill the vacancies of unexpired terms of those members of the General Committee who have left railroad service and whose terms have been extended to June, 1923. (*F. W. Brazier moved the foregoing resolution which was seconded, put to vote and carried*).

Scheduling Equipment Through Repair Shops

This committee was originally appointed to report on methods for scheduling and routing work in locomotive repair shops. In 1920 the committee submitted a report which outlined the advantages of scheduling systems and described the detail procedure for applying such a method to locomotive repairs. In the discussion following the presentation of the report considerable interest was manifested in the question of scheduling and routing as applied to car repair shops and the committee was continued to make a study of car department methods and recommend blanks or forms to take care of that branch of the work.

As pointed out in the report, scheduling is not considered applicable to all classes of car repairs, but it is believed that where this method of handling work is suitable, it will show the same beneficial results that are obtained by scheduling locomotive repairs. The report is particularly timely because of the large number of cars now in need of heavy repairs, which can well be handled by a scheduling system.

THE LAST REPORT from this committee was made in June, 1920, and covered the scheduling and routing of locomotives through repair shops. This report considers the scheduling and routing of passenger and freight equipment under repairs. Very little has been done to promote systematic scheduling methods when repairing equipment. One road in Canada has this work highly perfected and claims are made for a considerable increase in output with decreased costs due to its adoption. At least one road in the United States has recently introduced scheduling and routing practices in their passenger car repair shops and indications point to an increase in understanding and appreciation of methods widely used in contract shops and which are equally applicable to railroad shops.

In general the plans outlined for scheduling and routing locomotives (report of this committee for June, 1920) are employed for cars, passenger and freight. These classes of equipment will be considered separately and scheduling systems recommended in some detail. Passenger cars, like locomotives, are treated as units, but freight cars, by reason of the large number of repairs and speed of delivery, do not conform to passenger car methods. Groups of cars are scheduled as a unit and "days" of time are further subdivided into "hours," morning and afternoon. Gang work is recommended for passenger car repairs, but not to the extent suggested for freight repairs. In other respects freight car operations and material are scheduled, routed and checked in practically the same manner as other equipment.

Although a discussion of personnel does not properly come under the subject of this report, yet it is important to indicate the close relation existing between labor gangs and correct scheduling and routing plans. The same may be said of shop layout and design. Systematic repair methods may be applied to any existing plant, large or small, with good results, but the greatest benefit obtains when shops and tracks are layed out to suit an orderly and well planned scheduling system. Proper switching may be somewhat beyond the scope of this report, but no system can operate successfully unless instructions governing the selection and spotting of incoming cars are closely followed.

Details covering the following items incident to installing shop systems were fully covered in the report of this committee for 1920 and apply essentially to passenger and freight equipment: Schedule supervisor and assistant, experience and duties; location of schedule office; description of schedule and planning boards; shop blackboards and slide rules. This information will not be repeated here.

PASSENGER EQUIPMENT

The committee recommends considering only those classes which include all repairs having a labor cost of $50.00 and over.

PASSENGER CAR SCHEDULE CONSTANTS

(WORKING DAY ON WHICH OPERATIONS ARE DUE)

No. of Days in Shop	8	10	12	14	15	17	19	22	24	17	19	22	22	24
Paint Work										Burn	Burn	Burn	SB	SB
Schedule / Operation	A	C	D	E	F	G	H	I	J	K	L	M	N	O
PAINTERS														
Wash Outside	*1	*1	*1	*2	*2	*2	*2	*3	*3					
Wash Inside	*1	*1	*1	*2	*2	*2	*2	*4	*4	*2	*2	*3	*6	*6
Sandblast Start													*3	*3
Sandblast Finish (By Noon)													5	5
Burn Start										*2	*2	*3		
Burn Finish										3	4	5		
Lead Color													8	8
Sand Start										4	5	6	11	11
Sand Finish										4	5	6	12	12
Prime No. 1										5	6	7	6	6
Putty Start										6	7	8	9	9
Putty Finish										6	7	8	10	10
Sand Putty											8	9		
Prime No. 2										7	9	10		
Prepare Start	*3	*4	*5	*5	*5	*6	*6	*8	*9					
Prepare Finish	3	4	6	7	7	8	9	12	13					
Color No. 1										9	11	12	13	13
Color No. 2		5	7	8	8	9	10	13	14	10	12	13	14	14
Color Varnish	4	6	8	9	9	10	11	14	15	11	13	14	15	15
Ornament	5	7	9	10	10	11	12	15	16	12	14	15	16	16
Varnish No. 1	6	8	10	11	11	12	13	16	17	13	15	16	17	17
Varnish No. 2	*7A	*9A	*11A	*12	*13	*14	*15	*18	*19	*15	*17	*18	*19	*19
Paint Bottom				12	11	14	18	19	21	13	15	19	19	21
Paint Roof				13	14	16	18	21	23	16	18	21	21	23
Inside Start				*5	*5	*6	*6	*9	*9	*6	*6	*8	*10	*11
Inside Finish				*10	*11	*13	*15	*18	*20	*13	*15	*18	*18	*20
Touch Up	*3	*4	*5	13A	14A	16A	18A	21A	23A	16A	18A	21A	21A	23A
Clean (By Noon)	8	10	12	14	15	17	19	22	24	17	19	22	22	24
CARPENTERS														
Strip				1	1	1	1	1	1	1	1	1	1	1
Start Body	*2	*2	*2	*3	*3	*3	*3	*5	*5	*3	*3	*4	*7	*7
Start Platform	*2	*2	*2	*3	*3	*3	*3	*5	*5	*3	*3	*4	*7	*7
Finish Body	*2	*3	*4	*5	*5	*5	*6	*8	*8	*5	*6	*7	*10	*10
Finish Platform	*3	*4	*5	*7	*7	*7	*8	*10	*10	*7	*8	*9	*12	*12
CABINET MAKERS														
Strip Start				*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
Strip Finish				*1	*1	*1	*1	*2	*2	*1	*1	*2	*2	*2
Work Start	*2	*2	*2	*3	*3	*3	*3	*5	*5	*3	*3	*4	*7	*7
Work Finish	*2	*3	*4	*4	*4	*5	*5	*8	*8	*5	*5	*7	*10	*10
Trim Start				11	12	14	16	19	21	14	16	19	19	21
Trim Finish (By Noon)				13	14	16	18	21	23	16	18	21	21	23
TINSMITHS														
Roof Start	*2	*2	*2	*3	*3	*3	*3	*5	*5	*3	*3	*4	*7	*7
Roof Finish	*5	*7	*9	*10	*10	*10	*10	*12	*12	*10	*10	*11	*14	*14
Trim Finish (By Noon)	7	9	11	13	14	16	18	21	23	16	18	21	21	23
STEAMFITTERS														
Pipes Finish, Cover and Test	*5	*7	*9	*10	*10	*13	*16	*19	*21	*13	*15	*19	*18	*21
TRUCKS														
Off	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*5A	*5A
On and Level	*7N	*9N	*11N	*13TN	*12W	*15W	*17W	*20W	*22W	*14W	*15W	*20W	*20W	*22W
AIR BRAKES														
Finish and Test	*7	*9	*11	*13	*13	*16	*18	*21	*23	*15	*17	*21	*21	*23
ELECTRICIANS														
Work Finish				*4	*4	*5	*5	*8	*8	*5	*5	*7	*10	*10
Dyn. Set Up and Elect. Board				9	11	14	16	19	21	13	15	19	19	21
Batteries O. K., Dyn. Finish Test				13	14	16	18	21	23	16	18	21	21	23
Tested (By Noon)				14	15	17	19	22	24	17	19	22	22	24
UPHOLSTERERS														
Stock Received				2	2	2	2	3	3	2	2	3	3	3
Roof Finish	*4	*5	*6	*7	*7	*7	*7	*9	*9	*7	*7	*9	*11	*11
Trim Finish (By Noon)	8	10	12	14	15	17	19	22	24	17	19	22	22	24
SILVERPLATERS														
Stock Received				2	2	2	2	3	3	2	2	3	3	3
Stock Finish				*10	*11	*13	*15	*18	*20	*13	*15	*18	*18	*20
MACHINISTS														
Dynamo Set Up				*9	*11	*14	*16	*19	*21	*13	*15	*19	*19	*21
Dyn. Finish Test				13	14	16	18	21	23	16	18	21	21	23

KEY TO SYMBOLS USED IN CHART

*—Guide days; these days will be marked on shop blackboard.
A—Operation to be performed during afternoon period.
N—Operation to be completed by noon.
T—On dynamo cars trucks are to be under by noon of 10th day. Steamfitters and Bottom Painters' finishing day will be on 9th and Air Brake on 10th day.
W—On dynamo cars trucks are to be under car by noon.

NOTE

This chart is a summary of the passenger car schedules of January 11, 1921, and is put in this form for the convenience of the supervisors.

C. M. & St. P. Ry. Co.
Milwaukee Shops

Approved:
L. B. JENSEN,
Shop Supt. Car Dept.

Exhibit No. 1

Separate master schedules should be prepared for coaches, mail, baggage, express, combination, dining, parlor and sleeping cars, These schedules should be further subdivided for wood or steel construction. All master schedules should show exterior, interior and paint work separately, also work in all other participating departments, such as the tin and pipe shop, electrical department, air brake shop, etc. (See exhibit 1.) Any convenient combination of figures and letters may be used to designate particular schedules. For example, a "1-A-2" repair schedule would indicate a class 1 heavy exterior repair, class A heavy paint repair and a class 2 medium interior repair.

Exhibit No. 2

Schedule and planning boards or loose sheets may be used to advantage in the schedule supervisor's or foreman's office. Shop sheets, blackboards or bulletins conveying dates transferred from master schedules to department foremen will be found useful and are recommended. A calendar slide rule will greatly shorten the work of assigning actual dates on shop sheets. Exhibit 2 illustrates a shop bulletin sheet which is displayed on or near one end of the car under repair. Daily delay sheets should preferably be made from colored paper to distinguish them from other forms. (See exhibit 3.) Departments recommended for separate shop and delay sheets are as follows: Erecting and paint shop, tin and pipe shop, cabinet shop, smith shop, truck shop, upholstering and plating shops and electrical department.

The committee is of the opinion that passenger car repair schedules are to a large extent governed by schedules for painting and recommend examination of report by the American Railway Association, Section III, Equipment Painting Division, Committee 8, for 1920: "Classification of painting repairs and shopping of equipment." The intent is to eventually co-ordinate and standardize painting and repair schedules in so far as this may be possible. The operation of a passenger car repair shop scheduling system conforms generally to procedure already described in the report of this committee for 1920. The schedule supervisor issues shop sheets to departments and checks all work daily, recording delays which are posted or sent to foremen interested. Supervisor also directs the material routing clerk. Delays per car per day, or per month, or departmental delays may be collected weekly or monthly in any convenient form and forwarded by the supervisor to higher shop officers for information or action.

Freight Equipment

The committee suggests that only heavy repairs should be considered in any discussion of freight car scheduling. Such repairs require 20 man-hours and over. Separate master schedules should be prepared for flat, coal, box and refrigerator cars, these to be subdivided for wood or steel construction. The above separation may be varied to some extent when cars are repaired under a group system with specialized shifting gangs.

It is not possible at this stage of development to define arbitrary rules for scheduling freight equipment. Shop tracks and buildings are lacking in uniformity and a majority of shops and tracks are not at present so arranged that practices giving excellent results in one shop will work equally well in another. In general it may be definitely stated that some easily understood and workable system can be adapted to any shop, large or small, which turns out heavy repairs. It is generally conceded that individual cars should not be scheduled, the cost would be prohibitive even if thought advisable, but groups of cars of the same type and class of repairs may be scheduled successfully. Close attention should be paid to segregation of incoming cars if best results are to obtain. The stripping operation is important and should be given careful study.

DAILY DELAY SHEET Feb. 24-1922

Work to Start Saturday Feb. 25th

2-25	M. & E.	1528	Med.	Sch. E	3-13	NS
2-25	Slpr.	Spokane	Hy.	Sch. I	3-28	OS
2-25	Coach	4150	Hy.	Sch. H	3-18	NS

Operations Lost Friday Feb. 24th

OLD SHOP

1638-Plat Carp. Compl. XX-No. 2½" Draw Bar Bolts.
5001-Color Varnish-X-Held up by Carp.
3738-Trucks Compl. XXX-No Oil Boxes-Truck & Level XX-Air Brake Compl.-X
3604-Plat. Carp. Compl. X-Rotted End Timber.
Yakima-Inside Wash-X-Held by Strippers

Gains

1010-Varnish #2-0

NEW SHOP

5720-Varnish #2-XXX-Varnish #1-XX-Ornament-X-Held by Carpenters
346-Body Carp.-X-Entire New Sheathing on One Side
3814-Trucks off-X-10 Cars to Raise
Zenda. Cabt. Mkrs. Strip-X-Excess Stripping-4 Cars.

Gains

3123-Body Carp. Compl.-O

Exhibit No. 3

Constructive information pertaining to freight car scheduling is very meagre, but one large shop has perfected the following plan: Incoming cars are switched to three or four parallel tracks, having regard for the type of car and nature of repairs required, Highly specialized gangs are started on track No. 1 (see exhibit 4) and as fast as each gang completes the work assigned they pass to track No. 2, proceeding in turn to track No. 3, etc. The exhibit shows sixteen gangs and the time in hours each gang is expected to start and fininsh their special class of work. The stripping operation is shown shaded in order to make the gang movements more easily understood.

By the above method it is possible to schedule 10 or 15 cars in a group on one track as a unit. The time for each gang may be predetermined and stated on a master schedule exactly as outlined for passenger car units. This schedule, with hours, dates and duties inserted, should hang in a conspicuous position near the head of each working track where foremen and inspectors may check the progress of the work and quickly locate each gang, or each man, at any hour of the day. (See exhibit 5.) Under this shifting gang plan, when one gang loses time and another gang gains, those ahead may be used temporarily to help those behind their schedule.

The usual arrangement, where one foreman supervises all men on two or more parallel tracks and cars are switched in or out as fast as needed or finished, should be studied carefully, and it will be apparent that a good system for expediting repairs may

FREIGHT CAR REPAIR SCHEDULE

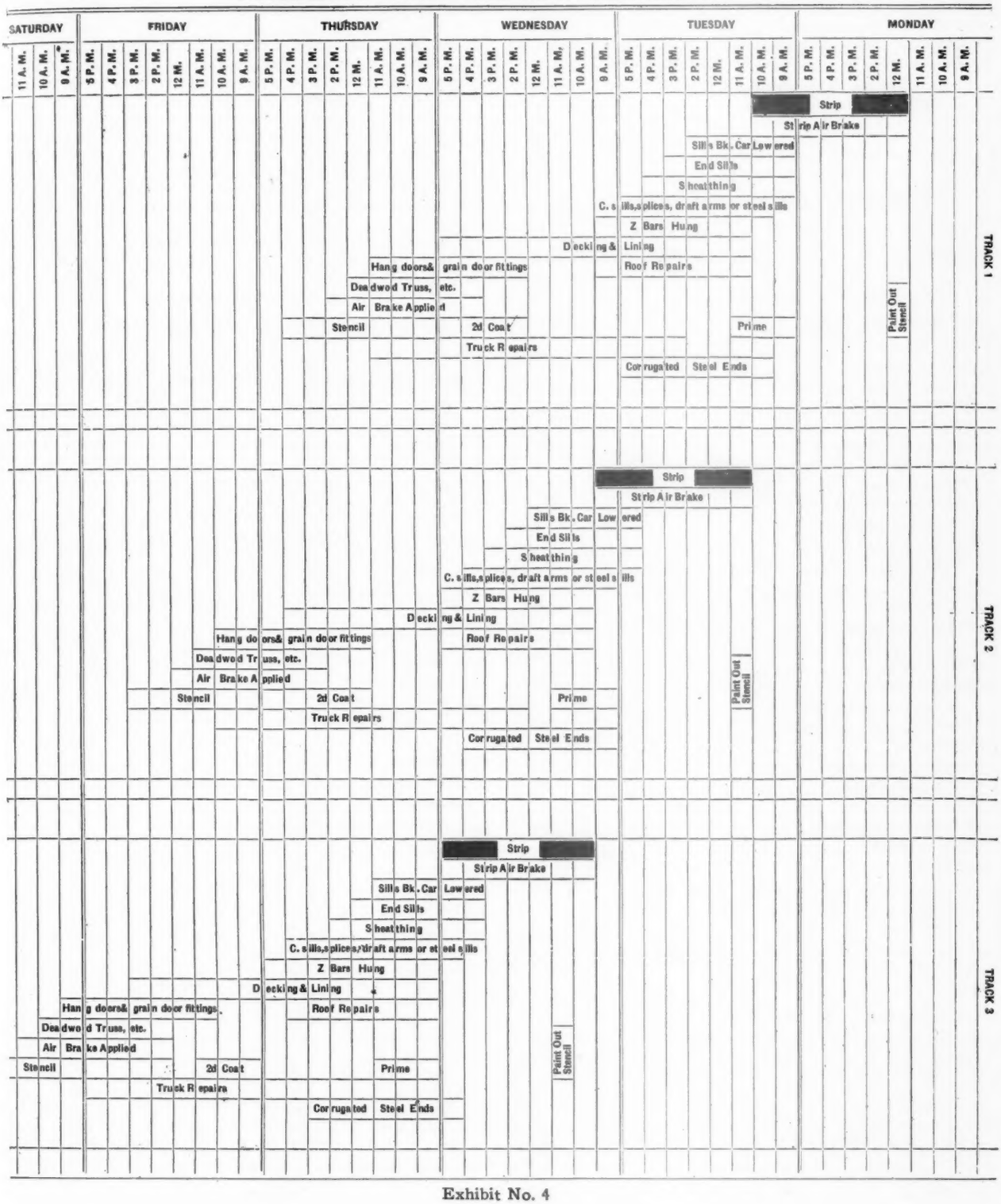


Exhibit No. 4

also be fitted into this situation, although forces may not admit of specialization and track room is insufficient for the more elaborate methods described above. More experience is necessary before a system can be definitely outlined and recommended for shops operating on the single foreman plan. Exhibit 4 is for study purposes and office use and shows graphically the information condensed on exhibit 5. A daily delay sheet, similar to exhibit 3 for passenger cars, should be provided.

Material may be handled by a separate system controlled by the schedule supervisor. One large freight car repair shop has a material routing plan operating as follows: An assistant foreman in the main repair shop inspects incoming cars and lists all material required for making repairs. This list is written up on a special form or order (exhibit 6) which is taken up by supply men at frequent intervals daily. The material routing clerk receives copies of these orders and periodically checks all depart-

ments visited by supply men and also checks material arriving at destination in the main repair shop. Record of delays by departments and delays for which supply men are responsible are tabulated by the routing clerk and subsequently forwarded to the general foreman or higher shop officer. The material clerk co-operates closely with the local storekeeper.

General

Output is primarily a function of personnel, systematic methods and shop capacity. All master schedules should be first designed to include the longest operation to be performed. When this is known all operations may be adjusted to suit the working forces. In freight car repair shops operating under the piece rate system the piece work price for certain work divided by the average hourly earnings rate will give the approximate time required for that work for one man on one car. If ten men are available for this particular work on ten cars the approximate schedule time allowance for the lot can be readily determined. Similarly in a day work shop, estimated time allowances from records can be adjusted until the entire force is working for capacity output under the schedule plan.

To partially illustrate the relation between output and shop capacity. A passenger car shop having capacity for 32 cars will have 32 X 25 or 800 track days available, considering 25 working days in the month. If records at this shop show that heavy repairs require about 20 days and medium repairs 12 days, it is evident that an output of 25 heavy and 25 medium repairs may be allocated for the month. If 40 heavy repairs are available for shopping, 800 track-days will be needed and no medium repairs can be shopped. Any other combination of heavy and medium incoming repairs may be figured on a total track-day basis as explained. The next step is to assign 20 and 12 day master schedules, assuming for simplicity that no light repairs will be shopped in this month.

In conclusion the committee desires to repeat with emphasis the recommendation that all passenger and freight car repair shops turning out heavy repairs adopt some systematic and workable plan which will first predetermine the expected output and then carefully adjust the working forces, by gangs or otherwise, to this output. Any plan should include careful consideration of switching and track facilities with reference to regularity of service and segregation of cars by types and repair classes. When this is accomplished all details necessary for best conveying dates and instructions to foremen and gang leaders may be worked out to suit local conditions and the mutual interests of local shop officers.

Summarizing an adequate scheduling and routing plan aims: 1. To eliminate dead time in the shop. 2. To prevent departmental delays, or one department delaying another, with resultant friction, in some cases. 3. To plan the work and proportion the forces for maximum production with minimum cost. 4. To enable supervision to work more effectively; making it unnecessary to hunt for material or cause for delays. 5. To insure prompt issue, transfer and delivery of material. 6. To supply reliable data which will assist officers to intelligently rearrange or relocate buildings, tracks or facilities. The report is signed by Henry Gardner (Chairman), Baltimore & Ohio; D. J. Mullen, Cleveland, Cincinnati, Chicago & St. Louis; P. F. Smith, Jr., Pennsylvania System; John Purcell, Atchison, Topeka & Santa Fe; C. J. Bodemer, Louisville & Nashville; E. H. Trottnow, New York Central. C. Juneau, Chicago, Milwaukee & St. Paul; G. W. Siedel, Chicago & Alton; J. J. Acker, Chicago, Rock Island & Pacific and E. T. Spidy, Dominion Engineering Works.

FREIGHT CAR REPAIR SCHEDULE

DATE IN SHOPS.....

TRACK No..... DATE DUE OUT.....

OPERATIONS.	TIME A. M.					TIME P. M.				
	8	9	10	11	12	1	2	3	4	5
Stripping Underframe and Air Brake										
Paint Out Old Stencil										
First Paint Commenced										
End Sills Commenced										
Side Sheathing Commenced										
Center and Side Sill Splices										
Draft Arms or Steel Sills Commenced										
Z Bars Hung Commenced										
Roof Repairs Commenced										
Corrugated Steel Ends Applied Commenced										
Decking and Lining Commenced										
First Paint Completed										
Truck Repairs Started										
End Sill Completed										
Side Sheathing Completed										
Draft Arms Applied Completed										
Corrugated Ends Completed										
Second Paint Started										
Roof Repairs Completed										
Side Doors and Grain Doors Commenced										
Dead Wood and Truss Rods Commenced										
2nd Paint Completed										
Application of Air Brake Commenced										
Application of Stencil Commenced										
Decking and Lining Completed										
Dead Wood and Truss Rods Completed										
Truck Repairs Completed										
Stencil Completed										
Track O. K. to Pull										

Exhibit No. 5

A B C RAILROAD

MATERIAL ORDER AND ROUTING SLIP

SHOP..... CAR No..... INITIALS..... TRACK No..... LOCATION.....

Quantity	DESCRIPTION OF MATERIAL	Patt. No.	No. Feet or Weight	MATERIAL	
				Price	Amount

Ordered—Date..... Time..... Required—Date..... Time.....

Cause of Delay

Completed in..... Dept—Date..... Time.....

Delivered to ..... " " ..... " .....

Completed in..... " " ..... " .....

Delivered to ..... " " ..... " .....

Completed in..... " " ..... " .....

Date Delivered to Car.....

Charge to..... Asst. Foreman.....

Exhibit No. 6

Discussion

C. E. Fuller (U. P.): I will make a motion that the report be accepted, but I would like to have the Chairman take these blanks and explain them clearly. (*The motion was duly seconded, put to vote and carried*).

Henry Gardner (B & O): These figures were given to me by members of the committee and I do not understand them all myself. I will be only too glad to answer any question anyone might ask in regard to the paper, that I can; otherwise I would like to call on members who were responsible for the exhibits

if they are present. Mr. Juneau of the Chicago, Milwaukee & St. Paul, supplied the first matter showing the schedule as in operation on his road. That is Exhibit No. 1, and also Exhibit No. 2.

C. Juneau (C. M. & St. P.): With regard to Exhibit No. 1, the cars, when they come into the shop, are inspected, and the work necessary to be done on these cars is laid out as shown in Exhibit 2. You will notice from Exhibit 2, that we have a board at the head end of each track in the shop, indicating the number of days that it is estimated the car will be in the shop undergoing repairs.

The first crew that gets to work on the car to be repaired is the strippers and the washers, and these are followed by the carpenters, then the cabinet makers, then the tinsmiths, and then the painters. These in turn are followed by the steamfitters and electricians. It is our aim to keep the different crafts working on the passenger equipment separately avoiding their getting in each other's way. By pursuing that method, we accomplish the work satisfactorily and no one craft bothers the other while the car is undergoing repairs.

The shop schedule, as shown in exhibit 1, which indicates what is to be done and how the work is to be followed out, gives very satisfactory results. We also schedule the material for the work on the particular car. Each supervisor who has charge of the work—forgings, or any particular class of work on the car—has a schedule which he is expected to follow, and if there is an operation lost the supervisor in charge of the lost operation receives a pink slip. Each morning these lost operations are caught up.

The supervisor, who has lost a certain number of operations which may delay the work and make it necessary to set the car back, is reprimanded, usually by the shop superintendent, and we have found in carrying out this plan that there are few of the supervisors who care to receive the pink slip, showing that they have lost an operation. The schedule is simple, and we have reduced the costs of repairs and expedited the movement of the car through the repair shop. In my opinion there is not much more explanation necessary than what is shown in Sheet 1. The work to be followed through is shown on "Repair Schedule of Car in Shop," Exhibit 2.

Mr. Fuller: I may not be very bright this morning, but I notice in the repair schedule for work in the shop that start is indicated by "1" and finish by "1" in the case of strip. What does that "1" mean there?

Mr. Juneau: I will call on Mr. Jensen to explain that No. 1.

Mr. Fuller: Mr. Jensen, will you kindly advise for the benefit of those of us who do not understand this just what is meant. On your blackboard you have two columns "Start" and "Finish." The first is "Strip: Start 1" and then "Finish 1." Then under "Note" you have "O.K. 1." What does that mean?

L. B. Jensen (C. M. & St. P.): We strip the car the first day. (start and finish stripping) That is the first day in the shop. We wash the car on the second day. (start and finish washing)

The carpenters start on the 3rd day and finish on the 6th. Platform work is started on the 3rd day and finished on the 8th. The cabinet makers start on the third day on the inside of the car and finish on the 5th. The tinsmith starts on the third day and finishes on the 10th. We give him all the latitude possible so he can work in between. That is the meaning of those numbers.

Mr. Fuller: Then you have painter. You have "Out 6-16" and "In -615."

Mr. Jensen: That means the outside.

Mr. Fuller: Outside and inside?

Mr. Jensen: Yes, sir. We paint and finish the car in nine days. That is probably just a repainted job. I don't know what kind of a car this is on the board, although I think it is an open platform car.

The Chairman: 4161.

Mr. Jensen: A coach.

Mr. Fuller: At the top of the sheet you have a row of numbers, which I understand signify the days of the month.

Mr. Jensen: No, sir, the days the car is in the shop. The three X's under 1, 2 and 3, indicate the three days the car was in the shop (this car on this board). That is the third day that particular car was in the shop.

Mr. Fuller: Then you mark it up each day?

Mr. Jensen: Yes, each day is checked off.

Mr. Fuller: You have down at the bottom airbrake, upholsterers, machinists, platers, without any date for the start, but you have 18, 19 and 15.

Mr. Jensen: That is the day they are supposed to be done with the car.

Mr. Fuller: They are to have their work done on the 18th?

Mr. Jensen: Yes, they work in between.

Mr. Fuller: It is the 18th day the car is in the shop?

Mr. Jensen: Yes, sir.

Mr. Fuller: Not calendar days?

Mr. Jensen: No, sir.

Mr. Fuller: All right, sir, I do not want to ask too many questions but I would like to know about this.

Mr. Jensen: We feel we have a very complete and simple system.

Mr. Fuller: Can you explain this Schedule 1, a little clearer, passenger car schedule constants? Exhibit 1. Working day on which operations are due? I do not quite get these figures clear. Will you explain it alphabetically and then numerically?

Mr. Jensen: We have different schedules shown by the letter. That schedule allows for the number of days that car is in the shop. We have different classes of schedules, of course, for different classes of cars.

Mr. Fuller: Can't you explain that a little bit, just what you mean by different schedules?

Mr. Jensen: On each schedule we have allowed a certain number of days for the car in the shop.

Mr. Fuller: Just carry us through one schedule.

Mr. Jensen: There is what we call the repainted car. It would be under a certain letter, and would be allowed possibly 12 days, depending upon the class of car that is undergoing repairs under that schedule.

Mr. Fuller: To get that clear, take color No. 2, under schedule E. Under Column E, color No. 2, at the top is the figure 14. Does that mean it is 14 days in the shop?

Mr. Jensen: The 14-day schedule, yes sir. A is an eight-day schedule, C is a ten-day schedule.

Mr. Fuller: You are not looking at the same column. Take color No. 2 on your operation under E. At the head is 14, E-2, 5, 7, and down to 8. What is 8?

Mr. Jensen: That is the 8th day that that car must be colored; the 8th day that it is in the shop the color must be applied.

Mr. Fuller: As I understand this blank, under that same inquiry, it is up to someone to see that the work has progressed so that on the 8th day color No. 2 has been applied to the car?

Mr. Jensen: Yes, sir. We have a schedule man who follows that up through the shop daily, checks up each board and each car in the shop.

Mr. Fuller: How is this schedule put out in the shop? You schedule this car out, and you make up this schedule. How is that schedule posted or handled?

Mr. Jensen: Each supervisor has a set of schedules. When he sees a 14-day car, he looks up his schedule on that which is Schedule E, and he knows just what procedure to follow under that schedule for that date.

Mr. Fuller: Who makes up the schedule for the cars to come into the shop.

Mr. Jensen: The schedule man.

Mr. Fuller: Is there a man specially for that?

Mr. Jensen: The schedule man goes through with the general foreman and decides what schedule is to be applied to that car.

Mr. Fuller: If the schedule is not up to date, the foreman in charge of that department furnishes a blue slip himself?

Mr. Jensen: No, sir, the schedule man furnishes it. He is the man who puts the black mark against us, and he turns that slip into my office, with an explanation as to why he is behind. It may be a question of material, or anything else, of course. If the excuse is legitimate it is all right, but if it is not it is all wrong.

Mr. Fuller: You will pardon me for asking so many questions, but I wanted to get at the bottom of this. He knows beforehand, to a certain extent, especially if it is material, that he is going to be behind on his schedule?

Mr. Jensen: Yes, sir.

Mr. Fuller: What does he do then?

Mr. Jensen: He reports to me.

Mr. Fuller: On any particular form?

Mr. Jensen: No, sir. If he knows that he is to run short of

material, he comes and reports to me, and I, of course, endeavor in turn to get the material from the stores department.

Mr. Fuller: Suppose they do not furnish it?

Mr. Jensen: Then the car is set behind and it is charged to the stores department.

Mr. Fuller: Do they ever resent it?

Mr. Jensen: Yes.

Mr. Fuller: They do not like it?

Mr. Jensen: No, sir.

Mr. Fuller: I want to thank you very much for what you have given me.

G. P. Kempf (P. & W. Va.): I understand this blackboard schedule and Schedule H are one and the same. H is the 19-day schedule. That compares with the photographs shown on Schedule 2. It will be noticed that the washout side shows two days; also on the blackboard it shows two days. I believe you can follow all the way through just how that is worked out.

Mr. Jensen: In other words, this car was under Schedule H?

Mr. Kempf: You will notice on touch-up, down at the bottom of painter, next to the last item. Under the 19-day schedule it says 18-A, and there is a notation for A. It says: "Operation to be performed during afternoon period," which is probably the latter part of the day and will go out the following day. All the way through I think these dots show explanations in the key.

I think the schedule is very simple. While it may seem complicated, I believe that with a little study, its workings will be readily understood. I know previous to my leaving the Milwaukee road I had something to do with the schedule system up there, and it facilitated the work all the way through. You will find that the foremen in general will oppose this schedule system; they won't like it. They think that you are going to make more work for them, but you will find, after the system has been put in operation and you get it working, they will be right back of it, every one of them. It helps them in the work and the schedule supervisor can do more for those foremen than you have any idea. I know I found it to be effective, and that the foremen all over the plant were in hearty co-operation with the system in every way.

T. H. Goodnow (C. & N. W.): To get off the schedules for a minute and get down to the practical work of putting in a schedule system, we have been attempting to inaugurate a schedule system for passenger equipment for about 16 months now; the scheduling of passenger equipment through shops will, of course, be dependent upon the number of shops involved and the extent of your passenger equipment. Those having larger numbers of cars will necessarily have to be governed by somewhat different conditions in their work of scheduling. Where they have more shops the conditions will be different, and for that reason I think that the committee has put the finishing touches on first. They say that the scheduling of the passenger equipment is dependent upon the paint shop. It has been our experience that it is just the opposite; the paint shop simply takes the cars as they come to it from the other shops and finishes them up. It depends to a great extent upon the drying of the paint and varnish.

We started out first with a system something like this and other systems. We asked the various railroads for and got their blanks, and in applying them it soon developed that it was simply a matter of timing. In other words, it did not bring out the real efficiency of the work. This scheduling does not indicate the efficiency of the shopmen, but of the foremen, and it puts it up to the foremen to get the efficiency from their shops. As the result of our experience at the start in attempting to schedule, we had to change and in making that change we had to develop a schedule of work. In other words, have different classes of cars coming into your shop; you have wood and steel cars mixed on which the work is different, and a foreman in one shop may be getting wooden cars and foreman in another shop steel cars. To make any judgment of the work to be performed, we had to develop very nearly a piece-work system. In other words, it was a time study of work, the renewal of parts, tearing down and putting back, and on that we had to base the scheduling of our passenger equipment. In doing so, knowing the class of cars that is going through a certain shop and what the foreman is handling, you have some idea of the work he has to do on those cars; he marks up the schedules of those cars through the shop according to what time he thinks he can get them out. Your man who is checking has the schedule of time for the various major operations at least, and he knows whether or not that foreman is marking his car up as he should.

With more than one shop handling the passenger cars, and knowing the kind of cars in each shop, you know whether each foreman is marking the car up for the best results. We found it necessary to develop a scheme of that kind, and at the present time the scheduling of equipment in our shop is marked up on that basis. It has cut down the man-hours on passenger equipment remarkably, but I do not believe a schedule of passenger equipment, based on a passenger car shop, will produce what you are really after.

So far as the scheduling of freight equipment is concerned, I have not much sympathy for that except when the roads are shopping their freight equipment by series and have the repairing done under a certain classified system of work. I believe that the majority of roads are not doing that and it is really time lost to have a classification such as we are considering here; that is, to have the work done according to these classified schedules. Where you are simply passing your freight equipment through the main shops, and making such repairs as are necessary I do not believe that the scheduling of equipment is advisable; that is, in the case of freight equipment. It takes up time without accomplishing much. I will admit, however, that where you are making freight car repairs by classified series there are many advantages in the system and there are advantages along the same lines when you make track repairs on the outside. From actual experience, however, I can say that the proper scheduling of passenger equipment will accomplish results both with respect to the time of the cars in the shop and in securing greater efficiency in making the repairs. With respect to that efficiency on the part of your men, you simply get that from putting one foreman's record against another.

J. J. Tatum (B. & O.): I note that there are 14 letters in Exhibit 1, following the word schedules. I was wondering if that means that you have 14 different classifications of repairs on passenger cars?

Mr. Jensen: Yes, 14 schedules.

Mr. Tatum: I take it that for Class A repairs, you have eight days allotted for the car to remain in the shop, and so on for the balance of the schedule.

Mr. Jensen: Yes.

Mr. Tatum: Who designates the class of repairs in any particular shop?

Mr. Jensen: The schedule man and the gang foreman make an inspection of the car, designating the class of repairs the car is to receive.

Mr. Tatum: The schedule man and the general foreman go out into the yard before the car goes into the shop, and decide what class of repairs the car is to receive?

Mr. Jensen: Yes.

Mr. Tatum: The schedule man turns it over to the gang foreman and assistant foreman to determine whether that car receives A schedule repairs, or B schedule repairs?

Mr. Jensen: The schedule man follows the work through the shop daily, checking up and seeing that each craft is meeting the dates on the cars.

Mr. Tatum: If you select a car for A class of repairs, your Exhibit No. 2 is marked accordingly, and if they select J class of repairs, your Exhibit No. 2 is also marked accordingly, and each class of workmen is required to meet the dates set.

Mr. Jensen: Yes.

Mr. Fuller: On what basis did you select your schedule man; from what class of employees? Are they car men, or clerks, or what are they?

Mr. Jensen: The schedule man that we have was simply a bright young man, formerly a clerk, and we brought him into that class of work, and we feel that in that regard we have done much better than if we selected a craftsman.

Mr. Fuller: My reason for asking the question is this: A car comes in and the inspector and general foreman inspect the car. Does the general foreman say what work must be done on the car and he and his schedule man then mark up the schedule on which the car will go through? The general foreman has the last word?

Mr. Jensen: Yes.

H. C. Oviatt (N. Y. N. H. & H.): Do we understand that the scheduling engineer assigns the particular schedule to the car, or does the general manager do that? Is the number of days that

the car will be included, for instance, under General Classification A, a matter for the foreman to decide?

Mr. Jensen: He makes out the schedule in conjunction with the inspector and the scheduling engineer.

A. C. Kells (A. C. L.): How do they decide whether a car will be in eight days or ten days or twelve days? What is the basis for making such a decision?

Mr. Jensen: That is determined according to the class of equipment. In the case of an open platform car it would be 8 to 10 days, and in the case of a steel car, 19, 20, 21 or 22 days. It is the class of equipment that governs to a certain extent.

Mr. Kells: Then you use your past experience as a basis for figuring?

Mr. Fuller: The class of equipment, plus the class of work to be performed?

Mr. Jensen: That is correct.

Mr. Tatum: The general foreman decides what kind of work you are going to give to certain equipment? If it is a wooden frame, with open platform car, it received a certain work, and you have a schedule representing the work that car is to receive?

Mr. Jensen: The general foreman assigns one of these 14 letters to each class of equipment when it is brought into the shop for repairs. After that is done, he assigns the different craftsmen to perform their work. They must get through with it by the time set. These dates mean that in the case of cars going through the shop, if the repairs call for machine shop work, the work must be ready on the date set so that the car may be finished in time to go out at the end of the period allotted for the repairs.

Mr. Oviatt: There should be a key covering each one of the schedules; that should be included in the report.

The Chairman: That key is printed at the bottom of the sheet on which Exhibit 1 appears for the various work on each classification.

Mr. Fuller: Mr. Oviatt has referred to a subject I have been thinking about for some time. You compare the cars that go out on the different schedules continued along with each other. You have a schedule in ordinary operation that will take 24 days, we will say, and then for example you have to remove the sheathing and you find the sill has rotted, and it is necessary to remove the sill. That necessity was not discovered until after the car went into the shop. For this reason, the time of that car in the shop will exceed your schedule. What note do you make, or how do you deal with that matter in order to determine that Gang 2 consumed six or eight days more turning the car out.

Mr. Jensen: We often find cars coming into the shop as you say. We do not find that condition to exist until we have stripped them and then we discover the rotten sill and it is necessary to change the schedule. Of course, we allow for much more time for putting in a new end sill, and we have to increase the schedule accordingly.

Mr. Fuller: That is what I wanted to get clear. You have to start with a given schedule, and then you encounter an obstacle which was unforseen and find that you must make up another schedule.

Mr. Tatum: I think that the committee could have made this report more helpful if they had printed these schedules so that the various railroads could apply them in making comparisons between the repairs to one set of cars, and the repairs to another set of cars. I think if this character of information could be given by the committee in its next report it would be very helpful. These remarks are not intended in any way as a criticism but simply as a suggestion to show how the report could be improved, in my opinion.

Mr. Juneau: What Mr. Goodnow said with regard to scheduling freight equipment through the shop, calls to mind that the committe as a whole was of one voice as far as the scheduling of freight cars through the shop is concerned at the present time. It is almost an impossibility unless you are having schedule repairs to a certain class of equipment done. Of course, you could lay out a classification, as has been done in the case of the passenger equipment. We will say that the repair card would indicate heavy repairs, and you are applying betterments to that car, which will require at least four days; if you put 14 or 15 cars on the repair track, the heavy repairs would require from four to five days, depending on the length of the schedule.

The committee when it met and talked over the schedule of freight equipment felt that it would be almost an impossibility to schedule freight cars properly unless the repairs were exceptionally heavy or in a case of rebuilding the cars.

Frank McManamy (Manager, Department of Equipment, United States Railroad Administration): The committee in this excellent report has no doubt covered all the ground that was intended to cover, but it occurs to me that there is one thing of primary importance in any scheduling system. We have here in one of the conclusions of the committee a brief statement of what an adequate scheduling and routing plan aims at: "To plan the work and proportion the forces for maximum production with minimum cost."

If we are to have the maximum of production and the minimum of cost, we must have a means of making comparisons, not only comparisons between the shops on your own lines, but between the shops on your line and some other line. Before we can do that, it is essential that we shall have a uniform classification of repairs, a classification that will apply to both freight cars, passenger cars and locomotives.

This is probably a little bit aside from the report of the committee, although it seems to me there is another reason—a very good one—why we should have a uniform classification of repairs. We find that the American Railway Association, of which this body is a Division, is now keeping and furnishing to the Interstate Commerce Commission and other governmental agencies records of the number of bad order cars, divided between heavy and light, etc. Without a standard classification of repairs, these reports do not mean much, for the reason that a light repair to a freight car requires less than 20 man-hours, whereas in the case of heavy repairs it may cost $100 or $1,000.

These reports cover not only the number of units of equipment repaired, the different classes of equipment repaired, but also the number of man-hours required to make the repairs.

These records are now being kept and an attempt is being made to include a record of the relative efficiency of different shops in the performance of labor in making these classes of repairs. As that matter stands today, the records are not sufficiently comprehensive in detail, and it seems to me, in view of the fact that these matters are being considered and eventually there will be an application of a uniform classification of repairs, that it behooves this organization to give very careful attention to this subject.

This division is the body which should lend its efforts in securing a proper classification of repairs for general application, so that when we make comparisons with some other roads we will be speaking the same language. As it is now, we are talking in different tongues, and unless we standardize the classifications of the repairs on different roads, the reports will not mean what they should.

Mr. Goodnow: There is one question I would like to ask the committee. Suppose you have a schedule and then you have a number of cars due for different kinds of repairs and want to get ont 15 or 30 cars, in a month. Your schedule man must watch his schedule of the different operations or some of these operations will be bunched. For example, if the carpenters' work has to be done in 15 days instead of 30 days, the carpenters have to go double speed for a part of the time and the rest of the time they have not so much to do. It seems t ome that will be something hard to adjust. To spread the work out so it would cover the month, and yet have nothing delayed.

Mr. Tatum: I move that the report of the committee be accepted and the committee continued in its work.

C. T. Ripley (Santa Fe): Anyone adopting a schedule system will find within a short time that there are certain difficulties with regard to the application of the plan. First, after the practice is started, a difficulty which will be encountered is the balancing of the gangs. It will be found that certain gangs will have more men than they should have and other gangs will be short of men. The foreman will have to redistribute the men. The second result will be found to be an insistent demand from the foreman for laber-saving devices.

A third point is the matter of having material delivered on time. Very often there is considerable trouble in that direction and it is a matter which requires constant attention to see that the material is on the job when required.

A fourth difficulty will be found in that blame is often placed on the mechanical engineering department for not furnishing drawings of the repairs to be made to the cars in accordance with the schedule.

All of these elements tend to decrease the output of the shop.

Mr. Goodnow: I move that the committee be continued and include in its next report optional classifications of schedulse, so far as passenger car equipment is concerned.

C. E. Chambers (C. of N. J.): Is there any reason why this committee should not be so constituted that it could take into its work not only passenger and freight car equipment, but locomotive equipment? There is a great opportunity for the improvement of classification of locomotive equipment. For instance, Class 3 repairs on the same type of engine may vary from $3,000 to $5,000, by reason of additional material and work. I think that the classification of locomotives should be carried into a subdivision, so that certain repairs would be known as 3-a, 3-b, 3-c, so as to show why it costs more for repairs in one Class 3 engine than on some other Class 3 engine. The same thing applies to Class 2 engines. Class 2 may be a locomotive having a firebox rebuilt or one having one or more boiler sheets applied. While classifications 1 to 5, inclusive, are satisfactory, they should be subdivided so as to show an explanation for the difference in cost of repairs in the different classes of engines.

J. Hall (So. Pac.): On our road, in the case of a car needing repairs, the general foreman proceeds to inspect the car on arrival. The class of repairs are discussed at that time with the car inspector and then the general foreman goes to his office and writes out the schedule. Each foreman and gang foreman in charge of the necessary work to the car, under the respective headings, receives a copy of a notice of the repairs necessary to the car. This notice is placed on the end of the car, and each foreman, as the work proceeds, keeps in mind the date when the car is to be repaired and ready to get out. The general foreman passes through the shop, looks over the car and he has also a schedule of dates showing when the car is to be put in service again. He immediately proceeds, by consulting the order issued for the repair of the car, to see how it is getting along. That is done every morning and when that practice is followed, we have no trouble in following a pre-arranged schedule which we have adopted, because each foreman is trying to get out of the other foreman's way. If one department is behind, for instance the finishers, we can draw from the cabinet shop and assist the department that is behind and in this way we avoid the congestion of certain workmen on certain lines of work and it works out admirably.

I think those who have visited the Southern Pacific shops can bear me out as to the fact that it is a relatively simple operation to carry out a system of scheduling if the details are properly worked out and there is adequate supervision of the work being done. You can see just how the situation is each morning when you pass through the shop. The superintendent of motive power or the superintendent of repairs in the car department goes through the car, observes the date when the operations began and when that car should go out. The cars must be in readiness three days ahead of the finishing date so as to give the air brake men a chance to do their work. The plan is very effective.

Mr. Tatum: Do I understand that Mr. Chambers wants to add to the motion I made that the classification of repairs to locomotives be considered along with the car worker?

Mr. Chambers: That is my thought. In my opinion there is no use in having a schedule for passenger equipment when it should take in all classes of equipment.

Mr. Tatum: I am willing that the classification of locomotives should be considered along with the classification of cars.

Mr. Hall: I would like to add one thought further, and that is with regard to the furnishing of materials for the repairs. Each foreman in the respective shops has received a schedule notice with regard to the car which is undergoing repairs in the shop, and they are notified that their part of the work is to be done at a certain time. If they are to supply certain material and it is not ready we do not rest a moment in getting the department to furnish the material that is necessary.

I. S. owning (C. C. C. & St. L.): It seems to me the schedule ling of passenger cars is a good idea. There are some practical difficulties connected with it, of course, in one case we get a certain car through in eight days, and we may have 12 men on that one car and then in the case of another car we only have six men on it, and it seems to me the committee should consider man-hours in putting each car through the shop schedule and classification.

Mr. Goodnow made a very good point and that is that you must consider the amount of labor to be put on that car in eight days and he raised the same point that one car may require eight days, another six and another four and the speed with which these cars are repaired varies. The man hours consumed is what talks.

The only reliable way I know of to compare this work is to take the old piece-work schedule. There is no especial work for a man to do. It does not say he must put a flowing coat of varnish on in one hour or one day but you can take your piece-work system and find just where you are and what he is doing. Mr. Goodnow is absolutely correct, the amount of time required in the paint shop to put on a cort of varnish is nothing compared to the time the car must remain on the track.

Mr. Tatum's motion, as amended by Mr. Chambers, was then put to vote and carried.

Report of Safety Appliance Committee

The next business was the report of the Committee on Safety Appliances, presented by Chairman C. E. Chambers, superintendent of motive powe. and equipment, (C. R. R. of N. J.) as follows:

"No advance report was made or printed by the Committee on Safety Appliances, the condition in general being the same as it was in June 1920. At that time the latest figures obtainable showed 60170 cars to be equipped. No later figures have been obtained, and it is presumed that all of these cars in service have been equipped by this time. No condition has arisen in the last two years which has made necesasry any special work for the Committee on Safety Appliances and therefore no action has been taken."

A motion that the report be received was duly seconded, put and carried.

On motion, the meeting adjourned.

The New Life Members

FOURTEEN NEW life members have been added to the list of the Mechanical Division since the last annual meeting was held in 1920. These men automatically become life members under the rules of order of the section, because of a membership in the Mechanical Division or one of its predecessors of 20 years or over. The list is as follows:

Date Joined	Name	Title and Railroad
1902	Carson, G. E.,	D. M. C. B., New York Central.
1901	Emerson, Geo. H.,	Chief of M. P. & E., Baltimore & Ohio.
1892	Fitzmorris, J.,	Supt. Motive Power, Chicago Junction.
1902	Hammett, P. M.,	Supt. Motive Power, Maine Central.
1901	Hogan, C. H.,	Manager, Dept. of Shop Labor, N. Y. C.
1902	Kaderly, W. F.,	General Supt., Southern.
1902	Manchester, H. C.,	Supt. M. P. & E., D. L. & W.
1902	Nichols, L. T.,	Supt. Carolina & No. West.
1902	Ramsdell, T. M.,	Master Car Builder, Oregon-Wash. R. R. & Nav. Co.
1901	Redding, D. J.,	Assistant Supt. Motive Power, P. & L. E.
1901	Sullivan, J. J.,	Supt. Machinery, Nash., Chatt. & St. Louis.
1902	Thompson, W. O.,	Gen. Supt. Rolling Stock, New York Central.
1902	Watson, S.,	Dist. Supt. Motive Power, New York Central.
1902	Young, C. B.,	General Mech. Engr., C. B. & Q. R. R.

Registration Figures

THE FOLLOWING FIGURES show the registrations for 1920 and 1922. The figures for 1920 show the registrations up to noontime the first day for book Number 1 and those for 1922 show the registrations up to four o'clock yesterday, the closing time for book Number 1:

	1922	1920
Members Mechanical, A. R. A.	360	355
Purchases and stores	13	9
Special Guests	107	102
Railroad Ladies	148	251
Supply Ladies	281	354
Supply Men	1,140	1,517
Totals	2,049	2,588

Registration, American Railway Association, Div. V, Mechanical

Adamson, E. A., M. C. B., Cent. of Georgia, Arlington.
Allison Wm. L., Senior V. P., Amer. Arch Co., Marlborough.
Anderson, C. H., Ch. Clk. Pur. Dept., B. & A., St. Charles
Appler, A. B., M. E., D. & H., Marlborough.
Ashley, S. F., Leading Draftsman, N. Y. C., Pine Hall.

Baird, G. O., M. C. B. Acct., St. L. & S. F, Chalfonte
Baker, C. N., G. M., Tenn., St. Charles.
Baker, W. G., Supt. Mach., Tenn. Cent., St. Charles.
Barr, L. S., M. Supt., Live Poultry Transit Co., Traymore.
Barry, Frank J., M. M., N. Y. O. & W., Haddon Hall.
Basford, G M, Cons. Engr., Lima Loco. Wks., Marlborough.
Bawden, Wm., S. M. P., T. R. R. Assn., Princess.
Beaghen, Thomas Jr., Mexican Petroleum Corp., Strand.
Becherer, Frank H., Asst. Engr., B. & M., Chelsea.
Becker, E J., P. A., New Orleans Public Belt, Traymore.
Becker, N. G., Shop Supt., D. & H., Haddon Hall.
Bender, W. A., Dis. M. C. B., B. & O., Ritz Carlton.
Bentley, H T., G. S. M. P. & Mch., C. & M. St. L., Marl.
Beyer, F. A., S. S., St. L. & S. F., Princess
Biancardi, Jos F, Leading Draftsman, N Y. C., Pine Hall.
Bilty, C. H., M. E., C. M. & S. P., Strand.
Bixler, H. C., Port of New York Authority, Marlborough.
Black, S. B., Car For., Interstate Tank Car Corp., Breakers.
Blake, F. H., Insp. M. P., Penn., Craig Hall.
Booth, W A, Eng. Loco. Const., G. T., Traymore.
Boring, T. J., Gen. For., Penn., Craig Hall.
Borland, W. P., Chief Bureau of G. T. Safety, I. C. C., New England.
Bowen. H. B., Works M. G. R., C. P., Seaside.
Bowersox, C. B., M. M., Tol. & Ohio Cent., Chalfonte.
Boyd ,W. R. Jr., Asst. Gen. Secy., American Petroleum Inst., Traymore.
Boyer, Chas. E., Gen'l Car Insp., Penn., Runnymede.
Boyer, L. K., G. F., B. & A., Pennhurst.
Bradley, C. H., Supt., Southern.
Bradshaw, J. H., Supt. C. D., American Cotton Oil Co., Ambassador.
Brogan, Jas. P., Asst. M. C. B., D. L. & W., Haddon Hall.
Brown, B. H., M. M., S. P. R. R. (T & L)., Ambassador.
Bruckert, R. H., Storekeeper, Ken. & Ind. Term., Shelburne.
Buechler, John A., M. M., D. B. C. & W., 130 St. James Place.
Buist, C. P., M. M., N. O., Public Belt Ry., Traymore.
Burel, W. C., M. M., West. Allegheny, Somerset.

Cade, W. E. Jr., Sec. New England R. R. Club, Princess.
Calder, W. W., M. C. B, B. & O., Haddon Hall.
Caldwell, Samuel, Enginehouse For., Penna., Elwood.
Calkins, A E., Dist. M. C., N. Y. C., Ambassador.
Callison, W. A., S. M. P., Monon, Strand.
Cann, Arthur T., P. A., Live Poultry Transit Co.
Carroll, J T., Gen. S. M. P., B. & O., Traymore.
Cartwright, Kenneth, Asst. to Eng. of Tests, N. Y. N. H. & H., Traymore.
Case, Truman G., Asst. Gen. For., N. Y. C., Pennhurst.
Carrey, Thos., C. C. Yard Master, D. L. & W., Shelburne.
Clark, James H., Supt., B. & O., Marlborough.
Coe, T. W., M. M., N. Y. C. & St. L., Alamac.
Coffman, B. J., Asst. M. E., R. F. & P., Dennis.
Coleman, L. C., Asst. Genl. Mgr., B. & M., Chelsea.
Cook, Bernard, Asst. Engr., N. & W., Chalfonte.
Cooper, F. R., Salesman, Gold Car Heating Co. Dennis.
Cope, Chas. C., Station Master, U. P., Craig Hall.
Coulter, A. F., Genl. Car For., Union, St. Charles.
Coulter, J. W., M. M., A. & S., Grand Atlantic.
Cox, Millard F., Mech. Eng., L. & N., Chalfonte.
Craig, Jas., Genl. Shop Insp., B. & M., Chelsea.
Cratzer, C. A., Passenger Repr., Penn., 1301 Pacific.
Crone, S. A., Past. President, Dennis.
Cunningham, W. P., S. M. P., Monongahela, Lleweyn Aparts.

Daley, W. W., M. M., N. Y. O. & W., Craig Hall.
Dampman, Charles P., Supv'r of Fuel Con., P. & R., 11 N. St. Catherine Pl.
Daniels, O. V., Asst. Gen. Strkpr., Penn., Atlantic Ave.,4401.
Daniels, Geo. F.
Davis, D. W., Asst. M. M., Lehigh Valley, Princess.
Davis, J. H., E. E., B. & O., Shelburne.
Davis, J. J., G. F., Penn., Loraine.
Davis, W. H., M. E., N. Y. O. & W., Haddon Hall.
De Hoyos, F. P., Genl. Agt., Nat'l. Rep. of Mexico., Ambassador.
Demarest, T. W., G. S. M. P., Penn., Brighton.
Dickinson, F. W., M. C. B., B. & L. E., Shelburne.
Ditmore, Geo. W., M. C. B., D. & H., Marlborough.
Douglass, J. H., M. C. B., W. & L. E., Chalfonte.
Downing, I. S., G. M. C. B., C. C. C. & St. L., Shelburne.
Downs, J. T., Supt., R. S. M. C., Haddon Hall.
Drake, W. A., Pen., Penna. Tank Line, Traymore.
Drew, Geo. W., Asst For., L. I., Pine Hall.
Driscoll, F. E., P. A., Erie, Traymore.

Eddy, Frank H., Supt. Shop, B. & M., Chelsea.
Eisenhauer, Geo., Elec. Engr., Erie, Haddon Hall.
Elklind, C. E., Chf. Drafts., A. T. & S. F., Ambassador.
Elliott, W. P., Gen. For., Term. R. R. of St. L., Princess.
Endsley, L. E., Prof. Ry. Mech. Engr., University of Pittsburgh, Haddon Hall.
Entwisle, T. J., Supt. Car Dept., Southern Cotton Oil Co., Strand
Ettinger, B. L., Cons. Mech. Engr., Southern, Dennis.
Everett, Ira, Chf. Car Insp., Lehigh Valley, Dennis.

Ferry, F. C., M. M., L. H. & St. L., Shelburne.
Fisher, Geo., M. C. B., G. T., Princess.
Foster, R. W., M. M., Marianna & Blountstown, Deville
Fowler, Geo. L., C. Engr., Dennis.
Freeman, L. B., Asst. S. M. P., Seaboard Air Line, Ambassador.
Fryberg, F. M., Asst. Mech. Eng., G. N., Princess.
Frye, A D., Supt. Ntl. Power, Piedmont & Northern, Strand.

Galloway, G. R., Dist. M. M., B. & O., Shelburne.
Gardner, Henry, Spec. Engr., B. & O., Chalfonte.
Garstang, Wm., Con. Gen'l. M. C. B, C. C. C. St. L., Breakers.
Geguire, Geo. N., Asst. Mgr. Dept. of Equip., U. S. R. A., Marlborough.
Gemlo, Wm., Sm. M. P. & R. S., M. & St. L., Traymore.
Gilliam J. B., G. F. C. Dpt., St. L. S. F.
Gimpel, J. H., S. C. Dept., Wabash, Strand.
Goldsmith Geo., S. S., Erie, Penhurst.
Gorton, Chas. E., Admin. Council, A. S. M. E., Haddon Hall.
Green, J. Paul, Sol. Apprent., C. R. I. & P., Traymore.
Goss, W. F. M., Pres. Ry. Car. Mfgs. Assn., Marlborough.
Gullage, Joseph, G. F., B. & M., Dennis.
Gregory, C F., M. M., Mfs. St. L. & O. Fallows, Ritz-Carlton.
Gregory, Wallace K., Ritz-Carlton.

Hadley, C. J., Asst. Supr. Tools., D. L. & W., Shelburne.
Halbert, M. W., Ch. Inter. Insps., Term. St. L. & E. St. L., Princess.
Hall, Frederic D., E. E., B. & M., Traymore.
Hall, James, M. C. Repairer, So. Pac., Chalfonte.
Hall, W. H., Ch. C. Insp., C. R. R. of N. J., Arlington.
Hanger, G. W. W., Member Railroad Labor Board, Dennis
Hammet, P. M., S. M. P., M. C., Chelsea.
Hannon, M. P., M. M., C. M. & St. P., Ambassador.
Harris, C. M., V. P., Hagerstown & Frederick, Traymore.
Hartley, Geo. B., Solvay Process Co., Ritz Carlton.
Harvey, H. H., Gen. Car For., C. B. & Q., Chelsea
Hass, H. P., Eng. of Tests, N. N., N. H. & H., Traymore.
Hellman, Chas., Gen. Car For., Pitts. & Shawmut, Terminal.
Henry, J. M., G. S. M. P., Penn., Chelsea.
Herring, W. M., Chf. Clk. Asst. to V. P. Mec., Southern, Shelburne.
Hickok, Wallace H., Chf. Insp. C. D., D. & H. Co., Marlborough.
Hitch, C. M., Dist. M. C. B., B. & O., Bouvier.
Hobson, W. P., M. M., C. & O., Chalfonte,
Holdan, H. C., For., L. I.
Hollan, W. D., M. M., National R. R. of Hayti.
Hoolihan, D. T., Gen. For., D. L. & W., Shelburne.
Horrigan, J., S. M. P., E. J. & E., Traymore.
Howell, F. P., Shop Supt., A. C. L., Pennhurst.
Hunt, R B., M. E., F. E .C., Sterling.
Hyland, A. T., Asst. S. S, N Y N. H. & H., Princess.
Hughen, J. N., B. P., Penna Tank Line, Traymore.

Ingram, M. D., Supt. of M., K. O. & C., Alamac.

Jansen, E. W., E. E., I. C., Dennis.
Jennings, Thomas, Supt. Shops, B. M., Chelsea.
Jensen, L. B., S. S., C. M. & St. P., Strand.
Johnson, J. O., Gen. For. Car Repairs, Southern, Fredonia.
Jones, V. L., Asst. Eng. Power Plants, N. Y. N. H. & H., Traymore.
Jones, W F., Asst. to Eng. of Tests, N. Y. N. H. & H., Traymore.
Jones W. M. Jr., Engine House For., F. E. C., Sterling.
Juneau, G. G., M. C. B., C. M. & St. P., Strand.
Justus, I. J., Spec. Insp., N. Y. C., Pennhurst.

Kadel, B. W., Cons. Engr, Brighton.
Keenow, R. P., V. P. & Gen. Supt., Donora Southern, Strand.
Kellogg, C., Div. Chf., U. S. Cham. of Com., Princess.
Kelly, L V., M. M., Frisco, Traymore.
Kelly, S. R., M. M., Southern, Princess.
Kent, F. S., Gen. Car Insp., Penn., Marlborough.
Kilborn, James E., P. A., Rutland, Dennis.
Kinnaird, L. S., S. M. P., C. & E. I., Chalfonte.
Kinney, M. A., S. M. P., H. V., Traymore.
Kinter, D. H., G. F. C. Dept., Monongahela, Watkins.
Kipp, A., G. C. Insp., N. Y. O. & W., Craig Hall.
Kleine, Herbert J., Dennis.
Kleine, R. L., Asst. Chf. Motive Power, Penn., Dennis.
Kleinhans, T. J., Secy., Interstate Tank Car Corp., Breakers.
Knox, Wm. J., Mech. Engr., B. R. & P., Penhurst.
Koeneke, T. B., Supt. Equip., Ind. R. Co., Strand.
Kraft, E A., Pure Oil Co., Lexington.
Krueger, A. J., M. C. B., N. Y. C. & St. L., Haddon Hall.
Kuhlke, Oliver H., S. M. P., C. & W. C., Alamac.
Kuhn, W. T., S M. P., T. H. & B., Traymore.
Kunkle, W. F., S. M. P., Charleston & West Carolina, Alamac.

Lentz, John S., M. C. B., Lehigh Valley, Dennis.
Lewis, John P., Asst. For., D. L. & W., Shelburne.
Linduer, W. C., Ch. C. Insp., Penn., St Charles.
Littell, Cero N., Supt., St.Louis Refy. Car Co., Ritz Carlton.
Long, John F., M. M., B. & O., Princess.
Lovell, Alfred, C. Eng., 141 S. Illinois Ave.
Lower, M. J., Asst. Gen. Mgr., Oswasco River, Traymore.
Lynn, S., M. C. B., P. & L. E., Pennhurst.
Lyons, A. N., Supt. Trans., K. & M., Traymore.

McConnell, C. H., E. E., P. & L. E., Haddon Hall.
McDevitt, W. P., M. M., K. & I. Term., Monticello.
McFeatters, F. R., Gen. Supt., Union, Haddon Hall.
McGutty, T. M., Gen. For., Penna., Princess.
McManamy, Carl, U. S. R. A., Marlborough.
McManamy, Frank, Mgr. Dept. of Equip., U. S. R. A., Marlborough.
McMunn, Wm. H., G. C. Insp., N. Y. C., Traymore.
McNicholls, C., Gen Frt. Agt., McKeesport Conn., Traymore.
Maddox, C. W., Ch. C. Insp., C. & O., Chalfonte.
Mallory, C. E., Supt., Kingan, Traymore.
Malthauer, Wm. S. M. P., B. & O., Shelburne.
Mancher, C. A., For. Upholster., L. I., Pine Hall.
Martin, K. H., Gen. Equip. Insp., Southern, Shelburne.
Mattingly, E. M., Joint Gen. For., B. & O. C. T., Alamac.
Maxfield, Colonel H. H., G. S. M. P., Penna., Brighton.
Meister, C. L., M. E., A. C. L., Pennhurst.
Merrill, F. A., Trav. Car Repair Acc., B. & O., Bouvier.
Michael, J. B., M. M., Southern, Princess.
Miller, A. T., Chf. Clk. S. M. P., Atlanta & West Point, Princess.
Miller, E.,Gen. Car Insp., B. & M., Chelsea.
Miller, E. B., Dist. M. C. B., B. & O., Lexington.
Miller, G. A., Supt. M. P. & Mach., F. E. C, Sterling
Miller, W. J, S M. P., Pine Bluff & Ark., Traymore.
Milliken, J., Member of M. C. B., Brighton.
Minette, J. H., Asst. G. F., N. Y. C., Breakers.
Moir, W. B., Genl. Car Insp., Penn., Runnymede.
Moncure, A. H., R. F. & P., Gen. For. Car Dept., Dennis.
Montagnet, J. M., M. C. B. Acct., New Orleans Public Belt, Traymore.
Montgomery, Hugh, S. M. P., Rutland, Dennis.
Moore, Geo. W., S. M. P. Car Dept., St. L. & S. F., Strand.
Morris, J. E., Engine House For., F. E. C., Sterling.
Morris, J. M., Asst. Traf Mgr., Lake Term., Traymore.
Mudd, Frank X., Pres., Live Poultry Transit Co., Traymore.
Mullinix, S. A., Spec. Apprent., C. R. I. & P., Traymore.
Mullinix, Sam W, S. S., C. R. I. & P., Traymore.
Murray, E. A., S. S., C. & O., Marlborough.

Naylor, F., M. M., M. C., Strand.
Neiser, N. F., Accountant, South Buffalo, Blackstone.
Netherwood, J. S., M. E. S P., Traymore
Nevins, B. E., M. M., Virginian, Traymore.
Newberry, C., M. C. B., N. O Public Belt, Traymore
Newman C. M., S. S., B. & O., Princess.
Norris, C. W., Div. C. F., D. & H., Princess.
Nowell, H. T., Mech. Supt., Central of Vermont, Haddon Hall.

O'Brien, Charles W., Car For., Lehigh Valley, Edgewater.
O'Brien, Jno. J., Supt. Car Dept., Term. R. R. Assn., Princess
O'Brien, John J., Pres., M. H. & C., Chelsea.
O'Brien, W. J., M. M., K. & M., Haddon Hall.
O'Donnell, T. J., Chf. Interchange Inspr., Niagara Frontier Inspr. Assn. Pennhurst.
O'Shaughvessy, P. J., Major U. S. A., Chelsea.
Oliver, Thomas, Gen. For., Detroit & Macinac, New Belmont.
Osman, H. L., G. P. A., Morris & Co., Traymore.
Overton, R. J., Mech. Repr., Southern, Princess.
Oviatt, H. C., G. M. S., N. Y., N. H. & H., Haddon Hall.
Owens, W. H., M. M., Southern, Osborne.
Owsley, C. W., Supt., Texas Co., Traymore.
Pace, R. T., P. A., Atlanta & West Point, Strand.
Pack, A. G., Ch. Insp. Bureau Loco. Insp., Interstate Commerce Commission, Breakers.
Paul, Jas., M. M., A. C. L., Princess.
Peiffer, Chas. E., M. C. B., B. R. & P., Pennhurst.
Perrine, W. M., M. M., C. R. R. of N. J., Alamac.
Perry, M. B., Chf. Car Repair Acct., B. & O., Bouvier.
Porter, C. A., Supt. T., Indian Refining Co., Ambassador.
Power, J. A., S. M. P., So. Pac., Traymore.
Queenan, Wm., Asst. Supt. of Shops, C. B. & Q., Chelsea.
Quereau, C. H., Supt. Elec. Equip., N. Y. C., Chalfonte.
Quinn, C. H., Chf. Elec. Eng., N. & W., Dennis.
Rae, J. C., M. M., A. H., Princess.
Rafferty, C. D., M. M., A. C. & H. B., St. Charles.
Ralston, J. A., M. E., Union, Traymore.
Ramsdell, T. M., M. C. B., O. W. R. & N., Chalfonte.
Rasbradge, R. B., S. C. D., P. & R., Dennis.
Rausch, Wm., P. & R., 11 N. St. Catherine.
Ream, A. H., S. M. F. & Eq., P. & S.
Renter, Sebastian, For., L. I., Dennis.
Richards, C. F., Chf. C. Insp., L. & H. R., Critchcroft.
Riley, S. B., S. M. P., W. M., Dennis.
Rink, Geo. W., Asst. S. M. P., C. R. R. of N. J., Traymore.
Ross, B. B., G. F. C. Dept., L. I., Dennis.
Runkel, William H., Engr., Union Tank Car Co,, Traymore.
Ruttger, F. W., Foreman, L. I., Pine Hall.
Salinas, Leon, Pres., National Rys. of Mexico., Ambassador.
Sandman, A. G., M. E., B. & O., Marlborough.
Savage, T. E., Asst. to Pur. Agt., Erie, Traymore.
Schneider, Louis, Ch. Cl. S. M. P., G. N., Grand Atlantic.
Scott, W. J., Rep., Penna. Tank Line, Traymore.
Schmoll, Geo. A., Dis. M. M., B. & O., Marl.
Schuyler, A. J., Gen. Car Insp., Virginian, Strand.
Sears, E., Dist. & Elec. M. M., C. M. & St. P., Chalfonte.
Seiders, I. A., S. M.. P. & Rolling Equip., P. & R., Dennis.
Seifert, S. P., Supt. C. Dept., N. & W., Brighton.
Shand, A. C., Chief Eng. Penna., Penna., Strand.
Shaughnessy, T. J., Shop Acc., Kentucky Ind. Term., Monticello.
Shaw, B. S., M. M., D. & S., Princess.
Sheahan, J. S., Supt. M. P., A. B. & A., Haddon Hall.
Sheehan, J. E., G. C. Insp., N. Y. N. H. & H., Pennhurst.
Sheehy, F. D., Marlborough.
Sheehy, J. Fred, Pres., Chicago Short Line, Marlborough.
Sherwood, M. B., Asst. For. Eng. House, Penn., Kentucky.
Sitterly, W. H., Gen. C. Insp., Penn., Chalfonte.
Skinner, Archie, Air Brake & Valve For., Santa Fe, Princess.
Smith, Abram E., V. P., Union Tank Car Co., Traymore.
Smiht, C. B., M. E., B. & M., Chelsea.
Smith, L. N, Div. M. M., Wabash, Princeton.
Staugh, F. B., Supt. Car. Equip., Roxana Petroleum Corp., Strand.
Storey, J. W., Ch. Draughtsman, Cent. Georgia, Arlington.
Street, Clement F., Marlborough.
Streeter, L. P., Air Brake Eng., I. C., Haddon Hall.
Stumpf, Carl, Foreman L. & R., Pines.
Sturrock, A., Asst. Supt. M. P., C. P., Seaside.
Sullivan, I. I., Supt. Mach., N. C. & St. L., Shelbourne.
Summer, Elliott, S. M. P., Penn., Brighton.
Sutherland, H. F., Supt. K. & I. Term., Alamac.
Symons, W E., Cons. Eng., Lake Erie Franklin & Clarion, Strand.
Taylor, F. C., Gen. Car Insp., Penn., Princess.
Terrell, C. H., Asst. S. M. P., C. & O., Haddon Hall.
Thistle, C. F., Chf. Car Insp., Cent. Reg. Penn., Dennis.
Tiley, Geo. E., Supt. Tank Car En., Gen'l Chemical Co:, Traymore.
Timpson, J. E., Asst. For., L. I., Pine Hall.
Tinier, F. S., Material Insp., Virginian, Dennis.
Trapnell F., Ch. Interchange Insp., All R. C. Lines, New England.
Tremain, F. W., M. C. B. Clerk, A. C. L.,Shelburne.
Trottnow, F. H., Spec. Insp., N. Y. C., Traymore.
Tryer, C. V., G. F. C. S., N. Y. O. & W., Haddon Hall.
Vittum, J. E., Chief Joint Insp., Hocking Valley, Arlington.
Vought, Harry D., Secy., New York R. R. Club, Central Ry. Club, Marlborough.
Wagstaff, Geo., Past M. M., N. Y. C., Chalfonte.
Wallace, O. A., Gen. Supt. C. R., A. C. L., Shelburne.
Walls, W. H., Examiner, U. S. R. A., Marlborough.
Walsh, F. O., S. M. P., Atlanta & West Point, Strand.
Warman, H. L., S. M. P., Frisco, Traymore.
Warner, W. W., Works Mgr., Erie, Princess.
Walter, P. S., Gen. Car Insp., Penn., Princess.
Weaver, C. F., G. F., Penn., Loraine.
Webster, H. D., Eng. M. P., B. & L. E., Ritz Carlton.
Weigman, E. H., Supvr. A. R. A. Interchange, L. & N., Shelburne.
Weigman, E H., Supt. Interchange, L. & N., Shelburne.
Wells, L. S., E. S., L. I., Marlborough.
Welther, A. G., Asst. Supt. of S., B. & O., Chalfonte.
Wescoe, F. B., Ch Car Insp., Penn., Craig Hall.
Whaley, T. H., Boiler Insp., Penn., Osborn.
Whitsel, Nelson B., M. M., C. & W. I., Glaslyn Chatham.
Wiles, C. F., Dis. Motive Power Insp., B. & O., Princess.
Williams, E. V., S. M. P., B. R. & P., Traymore.
Withington, Sidney, Elec. Engr., N. Y., N. H. & H., Marlborough.
Wolfe, R C., Gen. Eff. Engr., D. & H., Penhurst.
Woodbridge, H. C., Past M. M., B. R. & P., Traymore.
Woods, J. L., P. A., N. C. & St. L., Marlborough
Woody, E. R., M. M., C. & O., Alamac.
Woody, Randolph, C. & O., Alamac.
Wright, Wm., Storekeeper, D. L. & W., Shelburne.
Yanawina, F. S., Chf. Clk. Mech. Dept., Term. R. R Assn of St Louis, Princess.
Yarbough, W C., Asst. Treas., A. C. L., Marlborough.
Yergy, H J., Ch. C. Insp., Penn., 229 S. Conn. Ave.
Yoerg, Henry, S. M. P., G. M., Traymore.

Railway Club Secretaries Meet Today

THE SOCIETY OF RAILWAY CLUB SECRETARIES will hold its annual meeting in Room 449 at the Marlborough this morning, at 10 o'clock.

Reduction of Car Surplus

THE *Daily's* Washington correspondent wired yesterday that in the week ended May 30 the freight car surplus showed a reduction of over 24,000 cars, being 305,198. This included 195,439 surplus coal cars, a reduction of over 13,000 and 69,714 surplus box cars, a reduction of over 9,000.

Breaks in the Ranks

DEATH has claimed an unusually large number of members of the Mechanical Division since the last meeting was held in 1920. Among them are several widely known men who have been leaders in its affairs and those of its predecessors, the Master Car Builders' and American Railway Master Mechanics' Associations.

John W. Marden, who died on May 27, 1922, had been a member of the Master Car Builders' Association since 1877. Mr. Marden was one of the group of car men who took an active part in the pioneer development of the standards which have since become such an essential factor in the interchange of traffic between the railroads, and he served as president of the association in 1903.

F. F. Gaines, who died on August 26, 1921, has long been an active worker in the associations and served as president of the American Railway Master Mechanics' Association for the year 1914-15.

A. W. Gibbs has been chairman of the Tank Car Committee since its organization following the 1911 meeting of the Master Car Builders' Association. Under his administration the present standards of tank car construction were formulated, and adopted, and, this year's report of the committee was prepared under his direction.

The following is the list of obituaries read in report of the General Committee yesterday morning:

NAME	DIED
Acker, ... B., Gen. Car Foreman, P. S. & N. Ry.	
Barstow, Wm. A., Pres., Union Tank Car Co.	Feb. 10, 1922
Beattie, A. L., Napier, New Zealand	
Best, W. N., New York City	April 11, 1922
Boss, E., Supt. Motive Power, C. I. & W. R. R.	Dec. .. 1921
Branton, J. W., Master Mechanic, Illionis Central R. R.	
Brooke, G. D., Minneapolis, Minn.	April 10, 1922
Brown, T. A., Supt. Motive Power, La. & Ark. Ry.	Oct. .. 1921
Gaines, F. F., U. S. Railroad Administration	Aug. 26, 1921
Gibbs, A. W., Chief Mech. Engr., Pennsylvania System	May 19, 1922
Hartigan, Bert, General Foreman, Rutland R. R.	Oct. 14, 1921
Herman, A. O., Gen. Fore. Car Dept., Panama Canal	
Hodgins, G. S., New York City	
Leyonmark, J. H., Mech. Engr., Chicago & Alton R. R.	Aug. 1, 1921
Marden, John W., Waltham, Mass.	May 27, 1922
Montgomery, Wm., Master Mech. Cent. R. R. of New Jersey	May 21, 1921
Needham, E. F., Boston, Mass.	May 12, 1922
Oakes, Chas. E., Shop Supt., Kansas City Southern Ry.	Oct. 13, 1921
Robinson, W. A., Hamilton, Ontario	Sept. .. 1921
Robinson, M., Master Mechanic, A. T. & S. F. Ry	
Ryan, T. T., Master Mechanic, A. T. & S. F. Ry.	Oct. 24, 1921
Sheehan, R. J., C. C. D., Commonwealth Railways	
Sellers, Morris, Chicago, Ill.	May .. 1917
Vogt, A. S., Mech. Engr., Pennsylvania System	Nov. 11, 1921
Watkins, G. H., A. E. M. P., Pennsylvania System	
Wilson, David H. Jr., Consulting Engineer, Erie Railroad	Sept. 15, 1921
Williams, Edw. A., Glen Ridge, N. J.	April 29, 1922

Half-Rate Pullman Transportation

LAST YEAR A NUMBER of the members of the Mechanical Division were disappointed in securing half-rate Pullman transportation because they failed to obtain receipts when they purchased the Pullman accommodations. The conductor's check and receipt must be presented to obtain these reduced rates.

From Europe to the Conventions

F. A. Poor, president of the P. & M. Company, Chicago, accompanied by Mrs. Poor, arrived in New York from Europe on the Majestic Tuesday, and came down yesterday to attend the conventions.

Mr. Poor comes with a new interest in railway mechanical matters, since he and Burton Mudge recently bought control of the Joliet Railway Supply Company, Mr. Mudge having been elected president of this company.

Mr. Poor went to Europe about two months ago. He attended the convention of the International Railway Association at Rome, and was subsequently met by Mrs. Poor in Paris. They later returned to Italy.

"My own observations of railway conditions in Europe are similar to those which have been already published in the *Railway Age*," said Mr. Poor. "It is difficult to get sleeping car accommodations and trains generally are crowded. The railway service is much better in France than in Italy, and as was the case before the war, is best of all in England. In fact, in England some excellent new passenger equipment has been provided, there is very little crowding of trains, and the trains are being operated generally at pre-war speeds.

Mr. Poor took the aeroplane route from Paris to London, and later flew back from London to Paris. He enjoyed these experiences immensely and is very enthusiastic about the air as a means of transportation. He says, however, he is very glad to get back to the U. S. A., and is quite willing to use American trains for traveling for some time to come.

W. B. Storey Comments on the Convention

This is the first visit that W. B. Storey, president of the Santa Fe, has made to the mechanical convention. He is now A. R. A. executive committee member for the Mechanical Section, but he came up in railway service through the enginering department. He was long active as a worker in the American Railway Engineering Association, and is a past president of that organization.

"I have taken much interest in observing the mechanical convention and the exhibit," said Mr. Storey yesterday. "There is no doubt that the reports and discussions in the convention, and the inspection of the exhibits by railway men do much good.

"Some of the executives of the railways have questioned whether an exhibit is necessary in connection with the convention, and whether Atlantic City is the best place to hold it. The expense involved is substantial and some have thought it may be too large.

"I have not had time to make observations enough to reach definite conclusions regarding these matters.

"I could see this morning that the convention is conducted much like others I have attended; and there is no doubt that the interchange of information and ideas that takes place in the sessions broadens those attending and makes them better able to do their work. The exhibit is excellent and railway mechanical men who carefully go through it cannot fail to learn many things about the development of equipment and appliances which it will be advantageous for them to know.

"The purpose, of course, is contribute toward increasing the efficiency and economy of railway operation. Everything done should be done to accomplish that object, and it should be done in the way that will accomplish it most effectually. The railways in the eastern part of the country can without difficulty send a good many of their officers to Atlantic City. It is not so easy for railways west of Chicago, for example, to do so because of both the greater expense and the greater time required. To get the greatest benefit at reasonable cost they must select carefully the men they send."

Mr. Storey's entire attitude was that of a much interested observer who had not reached any definite conclusions regarding the matter under observation and did not intend to until he was sure he knew the entire situation thoroughly. The Santa Fe always has been well represented at the conventions.

Being himself very familiar with and a believer in the convention work of the American Railway Engineering Association, it may safely be anticipated that any recommendations Mr. Storey may make will be intended and will tend to, increase the value and effectiveness of the work of the Mechanical Section.

Mr. Storey leaves for New York this morning to attend a meeting of the executive committee of the American Railway Association. He expects to start for Europe the latter part of June for a two months' trip.

Enrollment

The enrollment booth at the main entrance to the Million Dollar Pier will open today from 9:00 a. m. to 1:00 p. m., 2:00 p. m. to 6:00 p. m., and 7:00 p. m. to 8:00 p. m.

I. C. C. Power Brake Hearing

The power brake hearing before the Interstate Commerce Commission at Washington, which was adjourned on May 29, subject to call at a date to be announced in the future, will be convened again on July 17, at which time examination of witnesses for the air brake manufacturers will be resumed.

New York Railroad Club Nominates Officers

The Nominating Committee of the New York Railroad Club has decided upon the following nominations for the next fiscal year, beginning November 1, 1922:

President, two year, F. T. Dickerson, secretary-treasurer, Central Railroad of New Jersey.

First vice-president, W. F. Jones, general storekeeper, New York Central, West Albany, N. Y.

Second vice-president, John J. Mantell, regional manager, Erie Railroad, New York.

Third vice-president, W. G. Gove, superintendent equipment, Brooklyn Rapid Transit System, Brooklyn, N. Y.

Treasurer, D. W. Pye, president, Tuco Products Corporation, New York.

Member of executive committee, three years, Elliott Sumner, superintendent motive power, Pennsylvania Railroad, New York.

Member of finance committee, three years, Charles C. Castle, vice-president, National Railway Appliance Company, New York.

Conventionalities

Among the convention visitors this year from far-away lands is W. D. Hollan, master mechanic of the National Railroad of Haiti.

F. S. Wilcoxen, fuel supervisor of the Chicago Great Western, has recently left that position to go with the Edna Brass Manufacturing Company, and is attending the convention this year in that capacity.

R. L. McIntosh is attending the convention in a new capacity this year. He has recently joined the staff of the Locomotive Finished Materials Company of Atchison, Kansas.

Harry C. Buhoup, for 40 years connected with McConway & Torley Company and a regular convention attendant, finds it impossible to attend the meeting this year.

W. H. Winterrowd, chief mechanical engineer of the Canadian Pacific and member of the General Committee of Division V, made but a flying trip to the convention. He arrived Tuesday and left Wednesday evening for Montreal. He will not be able to return.

Mr. and Mrs. Frank McManamy motored over from Washington on Tuesday. They have with them this year a nephew, Carl McManamy, who is just about to be graduated from Georgetown University.

Orris Bilger, mechanical engineer of the Kansas City, Mexico & Orient is here from Wichita, Kans., with his wife and seven-year old son. This is Mr. Bilger's first visit to the Atlantic City conventions.

Charley Gayetty is looking for a job. For two years chairman of the enrollment committee and for a number of years a most active committeeman, he feels lost with nothing to do but "roam the Pier." He received a rousing reception from his previous enrollment associates as he entered on his "new" duties Wednesday morning.

R. S. Cooper, general sales manager of the Independent Pneumatic Tool Company, has just returned from a trip to England and the Continent to attend the conventions. He reports poor but improving business conditions on the other side. England is in about the same position as regards trade as the United States was last fall.

The printer got his wires crossed yesterday and made *The Daily* say that Samuel Higgins, of the Railroad Labor Board, was formerly "deputy president of the Brotherhood of Railroad Hartford." Mr. Higgins is one of the railroad members of the board, and what *The Daily* meant to say was that he was formerly general manager of the New York, New Haven & Hartford.

Mr. and Mrs. Burton Mudge were joined at the convention yesterday by their son, Burton, Jr., who has just completed his freshman year at Princeton University. Burton, Jr., is now western junior golf champion of the United States, and has been captain of the freshman golf team at Princeton.

John M. Lammedee is attending the convention as a full fledged supplyman this year. Drawn from ranks of the railway press he is now sales engineer in the locomotive feedwater heater department of the Worthington Pump & Machinery Corporation for the middle west. Mr. Lammedee is a graduate of Purdue University and before his editorial work was with the Pennsylvania Railroad.

At any gathering of this sort the "old guard" is always in evidence. They spend a lot of time swapping yarns and proving seniority in years of attendance. Among those present here this year are C. E. Postlethwaite and his side-partner, W. H. Wilkinson, both of the Pressed Steel Car Company. While neither flew over the battle lines in France, nevertheless they are known as "aces," being a pair that's hard to beat.

Charles A. Schroyer, one of the oldest members of the railway mechanical association and for many years superintendent of the car department of the Chicago & Northwestern, came early in order to enjoy meeting and visiting with his many friends. Mr. Schroyer is taking things rather easy these days, and in this connection it may be stated that he probably brought with him to Atlantic City his golf clubs.

"Doc" W. H. S. Bateman of the R. S. M. A. executive committee, returned to Philadelphia on Wednesday to attend the commencement exercises of the University of Pennsylvania. His son, Stanley L. Bateman, graduated from the Wharton School of the University. Stanley, who with his older brother, Husten, has attended the conventions in former years, has just received his commission as second lieutenant, U. S. A. Reserve Corps.

Mr. and Mrs. J. W. Bettendorf and Mr. and Mrs. J. H. Bendixen arrived early from Davenport, Iowa. Mr. and Mrs. Bettendorf motored to Atlantic City from their home and enjoyed the trip greatly. At Lafayette, Ind., they were joined by their son, William, who is taking a course in mechanical engineering at Perdue. Mr. and Mrs. Bendixen have as their guest, Mrs. Harry Kleeberg, of Davenport. The entire party is stopping at the Traymore.

The many friends of C. E. Chambers will be glad to learn that his son, James, is rapidly regaining his strength after an operation for appendicitis. Young Mr. Chambers received his degree from Stevens Institute of Technology this year and after graduation went to Schenectady, where he was suddenly taken with a severe attack of appendicitis. Friends took him to a hospital at once, where the operation was performed. His father went to Schenectady, returning a few days ago, after all danger was over.

Harry T. Bentley comes to the convention this year, accompanied by Mrs. Bentley, in his new official capacity as general superintendent of motive power and machinery of the Chicago & North Western. During the past year Mr. Bentley made a flying visit to England, renewing his long-standing friendship with his English railway brothers. He visited the Crewe shops of the London & North Western, the largest railway shops in England, where he first entered railway work. He was accompanied by his daughter, Miss Emily Bentley, who unfortunately was ill with appendicitis during her entire visit on the other side.

Jose Urgelles, general master mechanic, and Jose C. Perez, superintendent of shops of the Cuba Railroad at Camaguey, Cuba, registered as special guests yesterday afternoon. They are representing J. W. Small, superintendent of motive power of the road, who is unable to attend this year. Mr. Small was formerly superintendent of motive power of the Seaboard Air Line and served as mechanical staff officer for the Southern Region of the United States Railroad Administration. Neither Mr. Urgelles nor Mr. Perez has attended the convention before.

R. L. Kline, assistant chief of motive power, Pennsylvania Railroad, arrived early Wednesday morning at the Dennis with his son, H. J. Kline, who was graduated Tuesday as mechanical engineer from Lehigh University. Mr. Kline, Jr., is to make railroading his career. At the university he was president of the Railroad Society and is now serving as special apprentice on the Pennsylvania Railroad at Altoona. He has served part of his time in this course during previous summer vacations and has but two more years to complete the course. He has had a fine start in railroad life and with the lessons to be learned from the successful career of his father, we anticipate a great future for him.

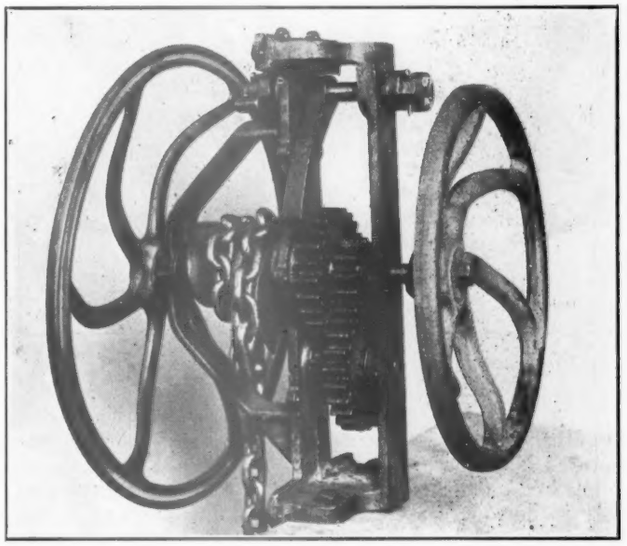
Friends of B. B. Milner, formerly chief mechanical engineer of the New York Central and a very active member of the mechanical associations, will be interested in learning that the Imperial Hotel at Tokyo, Japan, where he was making his headquarters, was partly destroyed by fire on April 17. It was at first reported that Mr. Milner had lost all of his belongings, but a notation from him on a copy of a special edition of a paper describing the fire indicates "nearly every thing saved". The hotel ordinarily can accommodate about 150 guests comfortably, but at the time of the fire there were 165 guests, fifty of them being members of the suite of the Prince of Wales and officers of the H. M. S. *Renown*. Mr. Milner after leaving the New York Central, spent one year in the Orient for Sale & Frazar, Ltd. He returned to this country last fall, but went back to Japan early this year and is now making his headquarters at Tokyo.

J. A. Miller, Superintendent motive power, Florida East Coast, a member of the association since 1890, is here from St. Augustine, Fla., to maintain an almost continuous attendance at these conventions. Mr. Miller is in the unique position of being with a road presenting ideal operating conditions. The Florida East Coast is a water level route of something over 500 miles in length. Oil is used exclusively for fuel on all locomotives. The line is primarily single track, which requires high speed service by both freight and passenger trains, These features have permitted Mr. Miller to establish one class of locomotive for both passenger and freight service and have given him an opportunity for standardization which in his 30 year's experence with that road has not been neglected. All road locomotives have 68-in. driving wheels. They are of the Pacific type, weighing about 200,000 lb., with 22-in. by 26-in. cylinders. This high degree of standardization in power is visibly reflected in cost of maintenance, which is substantially lower than that of other roads in this country.

Peacock Brake for Blind End Cars

A NEW DESIGN of Peacock geared hand brake for baggage, express, mail, and all kinds of so-called blind end cars, is one of the features of the exhibit of the National Brake Company, Inc., Buffalo, N. Y. This design was first used on Canadian Pacific baggage cars but is suitable for general use.

It is the enclosed type and is built of steel throughout. The frame is a one-piece steel casting and is designed for installation in the wall of the car so that all the gears are enclosed by the car wall and protected from dirt and weather. The brake is equipped with a second wheel so that it may be operated from the inside of the car as well as by the larger wheel outside the car. The brake wheel and the chain-winding drum, with a small portion of the frame, is all that is visible from the outside of the car so that the brake is not only neat in appearance, but meets the requirements which the severe weather in Northern Canada imposes. The tripping device is so designed that the pawl may be operated from either outside or inside the car. The gears of the brake give a double reduction and are so proportioned that a 100-lb. pull on the outside wheel will yield approximately 3,500 lb. on the brake chain.



Peacock Geared Hand Brake for Blind End Cars

Southern Pacific 2-10-2 Type Locomotives Ready for Shipment at the Eddystone Plant of the Baldwin Locomotive Works

New Devices Among the Exhibits

Wrought Steel Truck Side Frame

ONE OF THE remarkable exhibits of this year's convention is a wrought steel truck side frame formed in one piece from open-hearth steel plate. The construction of this frame, developed by the T. H. Symington Company, New York, is entirely different from

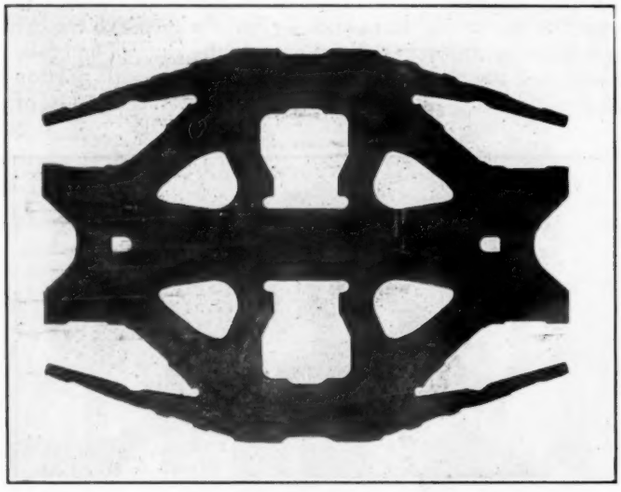


Fig. 1—The Sheared Blank from which the Side Frame Is Made

any other pressed steel truck side frame previously manufactured.

The blank for the entire frame is produced from a steel plate in one piece and at one operation by shearing between dies under a hydraulic press of high capacity. The blank after the shearing operation is shown in Fig. 1.

The sheared blank is then formed in flanging dies to the shape shown in Fig. 2, flanges being formed along the edges and around all of the principal openings.

After flanging, the blank is folded along two lines parallel with, and on either side of the longitudinal center line, following which operation the flanges around the bolster opening and the journal box seat are in contact as shown in Fig. 3. The flanges are then welded together at all points of contact. Bolster wear plates and journal box reinforcing pads are welded in position, brake hanger brackets riveted on and the journal box holes drilled. Cross sections of the frame at various points are shown in Fig. 4.

The journal boxes used with this side frame are the A. R. A. standard arch bar type. The journal box tie bars are integral with the frame and formed in a channel section, which adds materially to the stiffness of the frame. The A. R. A. recommended truck bolster can also be used.

The Symington wrought steel side frame is designed for use with either a rigid or a flexible truck, depending

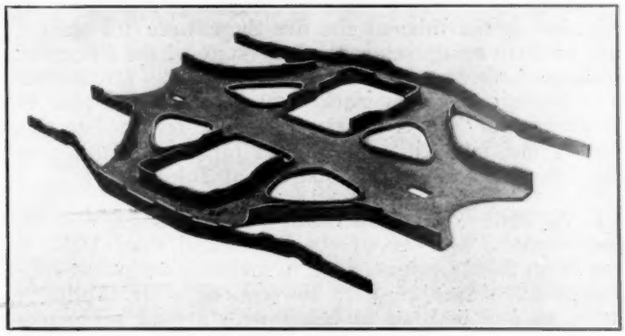
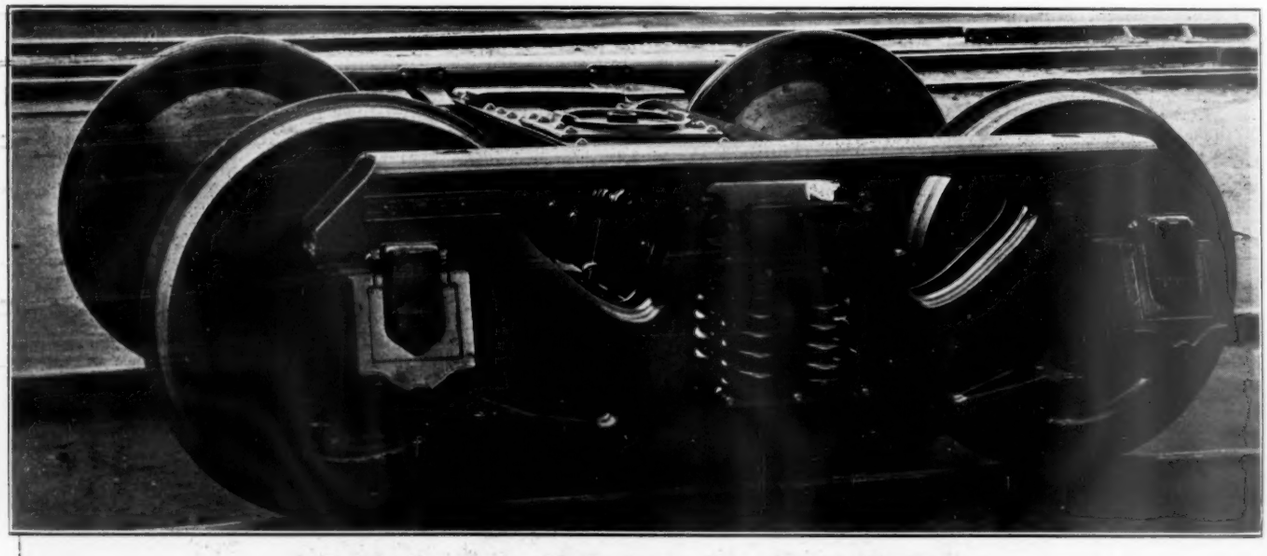


Fig. 2—Flanges Pressed Around Edge of Blank

upon the arrangement of the spring plank. The spring plank seat is not riveted to the side frame but is dropped into place at the bottom of the bolster opening. The standard seat has a boss at the center to permit the spring plank to swivel if desired. To make the truck rigid it is only necessary to rivet the spring plank to the seat as



A Freight Car Truck with Symington Pressed Steel side Frames

shown on the completed truck. This arrangement makes a rigid truck which can be readily assembled or taken apart.

Renewable wear plates are welded to the faces of the columns, thus preventing any wear of the column proper by the bolster. The brake hanger brackets are of malleable iron, riveted in the standard locations and arranged to take the regular hanger and pin.

The strength of rolled plates is very uniform and the method of manufacture of this side frame insures freedom from imperfections of material. The completed structure is well adapted to withstand repeated impact

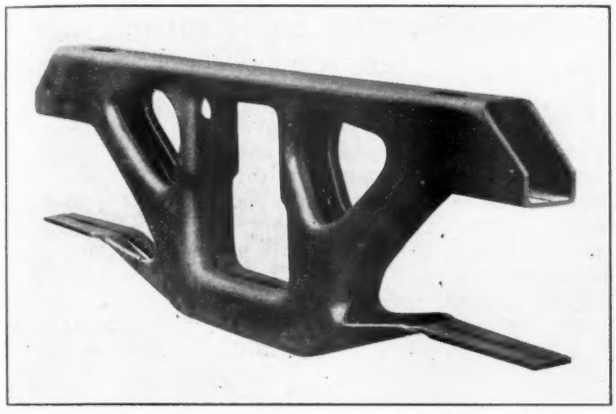


Fig. 3—Frame Folded Ready for Welding

and reversals of stress. It is stated that tests show the frame will carry a static loading equal to any frame now in general use, while the resistance to dynamic stress is greater.

The 55-ton side frame weighs about 300 lb. per car less than the 55-ton cast steel frame of the U. S. R. A. type

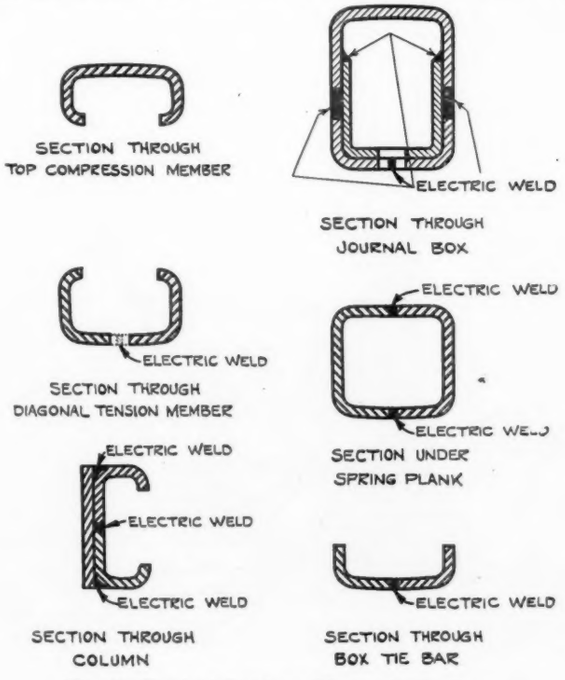


Fig. 4—Typical Sections Through the Frame

and 450 lb. per car less than the A. R. A. design of arch bar side frame of the same nominal capacity. The 55-ton frame is now in production at the works of the Cambria Steel Company and the 40-ton and 70-ton frames will be available shortly.

High Pressure Gas Regulator

FOR THE CONTROL and delivery of acetylene, oxygen, hydrogen and other high pressure gases, the Alexander Milburn Company, Baltimore, Md., has developed the gas regulator shown. Features of this device are said to be simplicity, ease of assembly, direct action and accurate regulation.

The regulator comprises a front cap containing an adjusting key, top spring button and tension spring. The body contains a flexible metal diaphragm in front, soldered in place. Over the diaphragm is screwed a bronze diaphragm plate or spring button to hold the tension spring. Inside the body is a fixed nozzle, containing a loose operating pin. Over the nozzle is loosely assembled the valve sleeve which has a row of gas ports

Milburn High Pressure Gas Regulator

drilled around its circumference and carries the valve seat. The seat closes against the nozzle by initial gas pressure on the valve sleeve and the pressure of a compensating spring resting in the recessed back cap.

The loose operating pin inside the nozzle is actuated at one end by a depression of the diaphragm and at the other end by pressure of the valve seat.

The seat of the regulator closes *with* instead of *against* the pressure, enabling the seating to be effected by a sealing pressure of several pounds instead of hundreds of pounds with attendant risk of damaging or splitting the seat, as in the case of regulators where the seat is yoked to the diaphragm. The closing of Milburn seat is independent of the diaphragm.

The valve is closed by the rear pressure of the compensating spring, assisted by initial gas pressure. When the adjusting key is turned to the right, the tension spring depresses the diaphragm, moving the loose pin, which forces the sleeve back, unseating the valve and permitting gas to enter through ports in the sleeve. The gas then passes through the nozzle to the diaphragm chamber and thence to the low pressure gage and through the outlet port. When multiplied gas pressure exceeds the tension of the

adjusting key spring, the diaphragm is released, permitting the loose pin to advance and letting the valve sleeve close the valve by pressure of the rear compensating spring.

The main operating part of this regulator, comprising only the pin and nozzle and a seat-carrying sleeve, is almost immediately accessible for examination, cleaning or renewal. The seat is subject to slight wear, as the spring closing the seat exerts only a pressure of several pounds in order to effect the regulation of the gas. If it becomes necessary to renew the seat, the sleeve carrying it is easily removed so that a spare sleeve can be immediately inserted, or the seat can be reversed. Every effort has been made in the design of this regulator to secure reduced size and weight with the least number of parts consistent with the function to be performed.

Bradford Boltless Truck Column

A NEW TYPE OF boltless truck column has been designed by the Bradford Draft Gear Company, New York, to interchange with bolted columns now used in Diamond arch bar trucks. This column is made of cast steel and has double the cross sectional area of the standard column bolts now used. It is constructed with an opening at the top to admit the upper arch bar at an angle of 45 deg., with a boss cast in this opening that fits into the drilled hole of the arch bar and which locks the column to the arch bar when the column is placed in a normal, vertical position. This column is then locked to the lower arch and tie bars with a cast steel lock which is riveted to the spring plank in the usual way with two 7/8-in. rivets.

A double-holed nut, both holes being threaded, made in one piece of cast steel or drop forged, is used for the journal box bolts; the box bolts are then screwed into this double nut from the square head of the bolts. This prevents loss of nuts or loosening of box bolts.

Clark Air Brake Retaining Valve and Bracket

THE CLARK COMPANY, West Pittston, Pa., is showing an air brake pressure retaining valve of novel design. It is not a complete device but consists of a weighted valve which can be substituted for the ordinary weighted valve which was universally used for many years before the introduction of the spring type of retainers. The Clark valve is made of a specially prepared rubber composition which the maker claims will remain elastic, will not cut or corrode the seat, and will not stick to the seat when cars are standing idle. The object of the device is to avoid the expense of discarding the old weighted type retainers and substituting those of the spring type. Old retainers can be converted by substituting a Clark valve and it is claimed that such retainers then become reliable under all conditions.

Two means are provided for adjusting the retained pressure to the desired amount. One provision consists of a screw in the top of the valve stem which can be screwed up or down to secure the desired lift and retained pressure, this adjustment being made on a test rack before the valve is placed in service. The objection to this is that the cap will probably have to be taken off and replaced several times before the exact adjustment is secured. To avoid this objection an adjusting and a lock screw can be put in the case or weight cap and adjustment thus obtained without the necessity of renewing the case.

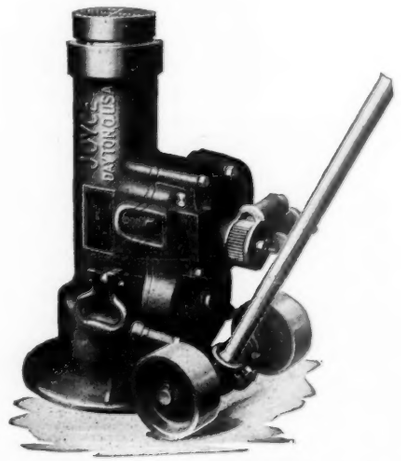
Another device shown is a retaining valve bracket which is permanently bolted to the car. It consists of a steel plate with two lugs and studs holding ears. To apply a retaining valve it is simply set in place, the stud nuts loosened, the ears allowed to drop down over the brackets on the retaining valve body and the nuts then tightened. By using this bracket and placing a union in the pipe below the retainer, it can be more easily applied or removed than by the method of attachment ordinarily followed.

Self-Lowering Ball-Bearing Jack

THE NEW JOYCE jack, illustrated, is made by the Joyce-Cridland Company, Dayton, Ohio, and is designed with its own bracket and wheels attached. The wheels are 5½ in. in diameter and sturdily built and attached, so that they cannot be easily knocked off. The operating lever is inserted in a socket and is used for a handle in wheeling the jack about. This also enables the operator to spot the jack directly under the jacking point and eliminates much exertion in pulling and tugging at the jack to get it directly under the load.

The jack is built in either the inverted or upright style, depending upon whether a large head or a small head is required. All shafts run in bronze bushings and the entire lowering mechanism runs in an oil bath which insures constant lubrication to all parts. It is only necessary to oil the jack about every six months, when the oil should be changed as in the crank case of an automobile. The jack is made in 50 and 75-ton capacities and over 50 per cent of the parts of different capacities are interchangeable; all parts, with the exception of the base, sleeve and cap of the inverted type, are interchangeable with the upright type. This is advantageous where various tonnage jacks of both inverted and upright types are used on the same road.

The Joyce jack is designed to stand an overload of 20 per cent. No exertion is required in lowering the load



Joyce Self-Lowering Ball-Bearing Jack

which is controlled by a small lever at the side of the jack through a system of worm and wormgears. Lowering is said to be under the absolute control of the operator who can at all times stop the load within the fractional part of an inch.

Coupling Devices

TWO DEVICES OF especial interest have been brought out recently by the McConway & Torley Company, Pittsburgh, Pa.; these are a quadruple shear coupling connection for passenger cars and locomotive tenders and an uncoupling device for type D passenger couplers.

The former of these devices, as will be observed by an inspection of the booth where it is exhibited, is a coupler and yoke connection providing greater strength and bearing surface than is ordinarily afforded in the common type of tail pin connection. The end of the coupler passes through three lugs on the yoke and is connected by a tail pin, inserted from below. This tail pin is held in place by a retaining plate and a split cotter, both of which are readily accessible. This arrangement enables the draft gear followers and yoke to be assembled in a unit, an important advantage. Obviously the tail pin is in quadruple shear.

The uncoupling device for passenger cars can be used with type D couplers fitted with underneath release. It has several important advantages, including simplicity in design, a section of ample proportions, easy application and removal and rigidity. The coupling may be disconnected from either one or both sides of the car if desired. The uncoupling rods clear all train pipes and platform attachments. They rotate for uncoupling in accordance with the usual practice on freight cars, eliminating the possibility of train partings due to short or bent pull rods. The uncoupling rods work independently of each other, the one in use at the time of uncoupling not operating the one on the other side.

Tank Car Valves

WITHIN THE LAST few years a number of complaints have been made of the failure of the present A. R. A. standard type outlet valve to prevent leakage, particularly of volatile products. Investigation has disclosed in the majority of cases that the trouble was due, aside from the "breathing" of the tank, to grit, straws, patches of gummy residue, etc., lodging on the valve seat and preventing the valve from going solidly into place. Investigation further disclosed the fact that when the valve seat was properly wiped off or cleaned the trouble with leakage generally disappeared. With a knowledge of the above conditions the American Car & Foundry Company, New York, designed the two valves described below.

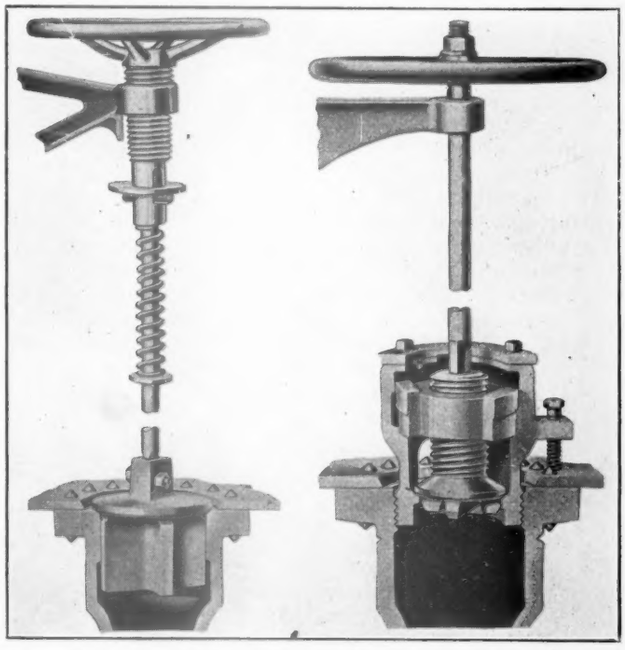
In applying the self-grinding valve, shown at the left of the illustration, the A. R. A. outlet chamber and valve are not changed nor is it necessary to throw away the valve rod and the valve rod spring. It is necessary, however, to cut off the upper part of the valve rod, cut the old valve rod bracket off the dome, apply a new threaded bracket, and substitute for the cam and handle the new type handwheel, all of which may be done at a small expense.

The principal feature of this valve is the property it possesses of wiping or cleaning the valve seat every time the valve is opened or closed, so that any foreign matter is dislodged and swept into the outlet chamber. Assuming the valve to be closed tightly on its seat, to open it the handwheel is turned to the left. This revolves the valve on its seat and the resultant wiping or cleaning effect continues until the lower end of the slot in the shank of the handwheel comes into contact with the 3/8-in. pipe thimbles riveted to the valve rod. Any further revolution of the handwheel to the left results in raising the valve from its seat.

To close the valve the handwheel is revolved to the right until the valve touches its seat. By revolving the handwheel further the spring is compressed and this compression serves to hold the valve tightly in place. During these latter revolutions the wiping or cleaning effort is again obtained. The function of the spring is to take care of variations in height from the valve to the handwheel bracket, these variations being due to the "breathing" of the loaded tank while in transit.

In addition to the wiping or cleaning effect which is a characteristic of the self-grinding valve, the positive self-locking valve, shown at the right, has the advantage of a positive lock. By this is meant that when this valve is finally seated it is absolutely impossible to force it off its seat by the upward pressure of a bar or any other instrument inserted in the outlet chamber. Furthermore, the locking and wiping mechanism is at the bottom of the tank and, as the valve rod slides freely in the valve dome bracket which, in the case of this valve acts as a guide only, the "breathing" of the loaded tank in transit cannot lift the valve from its seat and permit valve leakage. The positive self-locking valve also embodies practically all the desirable features for a bottom outlet valve as outlined on page 52 of the A. R. A. tank car specifications of 1920.

The substitution of this valve to existing tank car equipment fitted with the standard A. R. A. type of outlet valve necessitates replacement of the outlet chamber with one of a new type. The rivet spacing in the flange of



Self-Grinding and Self-Locking Tank Car Valves

the new outlet chamber agrees, however, with that on existing standard American Car & Foundry Company outlets, so that the old outlet may be removed and the new one applied without punching or drilling any new holes in the tank shell. New valve rods and handwheels are also required, as the old style cam and handle is not suitable for this type valve. It is not necessary, however, to replace the valve rod dome bracket, as almost any type bracket can be used.

To open the valve the handwheel at the top of the valve rod is turned to the left. This imparts a vertical downward movement to the wing nut, but the valve does not yet rise from its seat; it simply turns in the same direction

and at the same speed as the handwheel until about three complete revolutions have been made. By this time the wing nut is bottomed on the lower shelf inside the valve cage, and any further revolutions of the handwheel result in raising the valve off its seat.

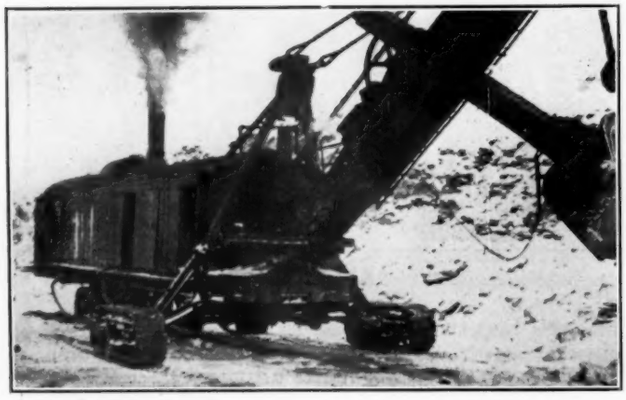
To close the valve the handwheel is turned to the right, this movement resulting in a downward vertical travel of the valve until the bearing surface comes into contact with the valve seat in the cage. When this occurs the wing nut begins to move upward and the valve itself completes the three wiping or cleaning revolutions on its seat until the wing nut comes into contact with the upper shelf in the valve cage. Any further revolution of the handwheel simply increase the tightness with which the valve is forced to its seat.

Both valves can be readily adapted to the discharge of tank cars without removing the dome covers, by extending the valve rod through a stuffing box located on top of dome and when so operated these valves should always be used with the newly designed A. C. & F. Co. vacuum valve, the use of which automatically prevents the formation of a vacuum inside the tank.

Bucyrus Caterpillar Shovel

THE BUCYRUS COMPANY, South Milwaukee, Wis., has recently announced that it is prepared to equip all sizes of railroad-type shovels with caterpillar traction. The principal advantages of mounting a shovel of this type on caterpillars may be summarized as follows: no time lost in moving up, an ordinary move requiring about 10 sec. only; no rails to lay, no jacks to release and set and no stops during operation to reset jacks; may be quickly and easily moved back out of the way, or turned around; can always dig at most effective distance from bank; lighter work for pitmen and fewer men required.

This mounting consists in general of two forward caterpillars, replacing the jack arm, and two rear caterpillars mounted under the rear end of the shovel. Both front caterpillars are drivers and are so designed that they can swivel and adjust themselves to unevenness of the ground. The rear caterpillars consist of two units



Railroad Type Shovel With Caterpillar Traction

mounted on the same frame and are designed with sufficient strength to permit the crossing of holes and ditches without the delay incidental to filling in.

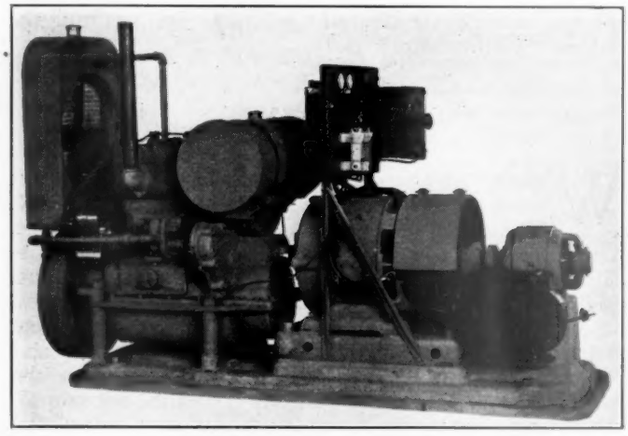
Steering is accomplished through the rear caterpillars, the steering arm being integral with the pintle of the rear trucks. It carries a heavy gear segment which engages a pinion on a vertical shaft and is driven by an independent center-valve, reverse-type engine, suspended underneath the frame. This engine may be operated either from the operator's stand or from the ground alongside the rear caterpillars. Steering in curves of large diameter may be done by the swinging of the boom without the steering mechanism.

Propelling is accomplished through the front caterpillars. Both may be driven together or each one independently, forward or backward. The propelling speed is about half a mile an hour. The tractive effort is sufficient to enable the shovel to climb 15 per cent. to 20 per cent. grades with ease. For transportation by rail, railroad trucks may easily be substituted.

Electric Welder With Gas Engine Drive

A COMPACT OUTFIT FOR electric arc welding, consisting of a gas engine, a welding generator, and control panel, has been developed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. This outfit should be adaptable for use on maintenance of way trains or for use in any place where it is desirable to employ arc welding or cutting, and where electric power is not available.

The gasoline engine is a 2-cylinder, slow-speed, marine type, and the outfit is completely self-contained, the engine



A Self-Contained Gas Engine-Driven Electric Welding Outfit

and generator equipment being mounted on a substantial bedplate, together with the oil and gasoline tanks and a radiator for cooling the engine. Forced feed lubrication is used, making it unnecessary to level the machine before placing it in operation.

Plush Renovator

A LIQUID CLEANSER, known as Chase plush renovator, has been developed by L. C. Chase & Co., Boston, Mass., makers of Mohair car plush. This compound is in concentrated form—a small quantity to a plentiful supply of water makes an ideal solution for ordinary soiled surfaces. Where dirt is more stubborn, a stronger solution can be made; even though used full strength, it is guaranteed harmless. It is said that it will not start the dyes nor impair the surface beauty, is non-inflammable, contains no harmful ingredients such as gasoline, and has practically no odor.